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ABSTRACT

One of seven sections of a report that examines the assessment of occupational competence, this chapter examines the issue of certification from the perspective of the consumer of services performed by the individual possessing the credential. To provide an understanding of the current practice of competence assessment as a component of certification, the first portion of the chapter elaborates the process of how an occupation becomes a profession. In the course of describing the purposes and function of licensing and certification, particular attention is paid to the link between specifying the credential-awarding process and setting the goals that are established for the process. Following a description of the career areas in which certification plays an active role, the definition and measurement of competence is discussed using examples from prominent current practices. Among the key issues addressed in the chapter are the following: What is the relationship between certification and competence? Does certification ascertain minimal performance standards or are there other functions it performs that are more important? And, how do certification procedures direct educational priorities, with reference to the requirements of the world of work? (Other sections of the report are available separately--see note. The first is an overview: the last is a synthesis of issues.) (IRA)

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THE ASSESSMENT OF
OCCUPATIONAL COMPETENCE

3. COMPETENCE ASSESSMENT FOR
OCCUPATIONAL CERTIFICATION

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I. INTRODUCTION AND CONTEXT TO EXAMINE CREDENTIALING

The increasing scope of professional credentialing has had a profound impact on the nation's systems of education and work. Credentials are a major gatekeeping mechanism for opportunities to work, they stratify people within society, and they recognize those who have met standards of excellence.

This chapter describes the context in which awarding a credential occurs and presents the findings of a survey of occupations* undertaken for this report. The survey examined issues that affect the validity and job-relatedness of certificates, licenses, and credentials actually in use. The quality of mechanisms for awarding credentials is affected by the characteristics of the people who design them, the techniques used to define and measure competence, and by various aspects of test construction and utilization. With regard to these matters, the current state-of-practice in credentialing revealed by our survey does not adequately reflect the state

*Traditionally, the term "profession" has been reserved for the more learned occupations such as medicine and law. The distinction between an occupation and a profession has often been based on requirements for entry such as degrees and work experience. These distinctions have become blurred in recent years as more occupations increase their requirements for entry. For purposes of analysis in this report, no distinction is made between an occupation and a profession, and the terms are used interchangeably.

of the art. Several alternative models for setting up a process to award credentials are presented.

Competent workers can come from the education, credentialing, or workforce sectors of the nation's human resource system. The education sector plays a central role in establishing professional credentials, not only in the training of manpower, but also in defining competence, constructing tests, and setting performance standards. In combination, these activities make education a powerful tool for including or excluding people from professional status and, ultimately, from work opportunities. The institutions that award credentials and the workforce sectors which require them share the power to control access to jobs. Consequently, questions of equity are frequently raised with regard to the fate control exercised by those who award and/or require credentials as described in this chapter.

Background to the Review

Several processes may lead to the recognition of individual competence. Credentialing is the generic term for any formal recognition of competence. Thus, credentialing refers to academic recognition for completion of educational programs and also refers to certification and licensing.

Certification is a process by which a nongovernmental agency or professional association grants recognition to an individual who has met qualifications specified by that

agency or association. These qualifications might include graduation from an accredited or approved education program, passing an examination, and completion of a designated work experience requirement. While certification is voluntary, in the sense that the government does not require it, some employers do require certification. Workers who are certified are not necessarily more competent than those who are not: They have merely met the requirements and standards of the certifying agency (Shimber, Esser, & Kruger, 1973).

Licensure is the process by which a government agency grants permission to an individual to engage in a given occupation if that person has attained the minimal degree of competence necessary to ensure that the public health, safety, and welfare will be reasonably well-protected. There are two types of licensure laws. "Title acts" require individuals to meet specified requirements before they can use certain occupational titles, but they do not preclude individuals from working without having met these requirements. (For example, unlicensed individuals may legally work as accountants as long as they do not represent themselves as "certified public accountants," a title legally reserved for those who have met requirements of a state licensing board.) Because these licenses are not required for many types of jobs within an occupation this procedure is sometimes referred to as "permissive licensure." Under the second type of licensure laws--"practice acts"--individuals, no matter what they call themselves,

may not engage in the activities of an occupation unless they have been authorized to do so by a national, state, or local government agency. For example, only a licensed physician can legally perform medical surgery. These required licenses are sometimes referred to as "mandatory licensure" or "restrictive licensure." In principle, this type of licensure is required only where an occupation's activities could endanger public health, safety, or welfare. In practice, however, some professions, such as barbering, have achieved restrictive licensure without clear demonstration of potential harm (Shimberg, Esser, & Kruger, 1973; Hogan, 1979).¹

In everyday use, however, the terms certification and licensure have no uniformly accepted definitions. Thus, a registered nurse is, in fact, a state licensed nurse. A certified public accountant is, in fact, a licensed accountant. Furthermore, some states refer to permissive licensure as "state certification" or as "registration." Certification is often thought of as a higher standard than licensing, but this is only true in those specific instances where certification denotes competence beyond the entry level. In any case, the technical issues discussed in this paper (i.e., job-relatedness, validity, test construction, and utilization) are the same for all levels of credentials, be they certificates or licenses.

In this chapter the term credentialing is used interchangeably with certification and licensing when the generic

concept is appropriate, and may refer to either or both. Sometimes the term certification is used alone when a point is equally applicable to licensing. The authors have tried to make clear distinctions among credentials, however, when such differences are relevant.

The Survey of Occupations

There are more than 2,000 occupations in the United States that are regulated by one or more government agencies (Nafziger & Hiscox, 1976). Our survey of a sample of occupations was intended originally to include only those occupations that used competency-based certification procedures, i.e., used a task analysis to define occupation role requirements, developed measures of competence needed to perform these requirements, and validated those measures against performance outcomes. Because no certification system was found that met these criteria, an alternative approach to developing the sample was taken in which the authors first compiled a list of occupations surveyed in standard reviews of certification and licensing (Dantes, 1976, 1977; Angel, 1970; Shimberg, Esser, & Kruger, 1973). Occupations were chosen that appeared in more than one review. From this list, occupations were then selected which have national organizations that offer certification procedures to their members (as indicated in the Encyclopedia of Associations [13th ed., 1979]). This list was adjusted for

under-representation of health occupations, a large component of the nation's certified labor market.

In our study, the total sample of 70 occupations is represented by 40 certifying agencies. Twenty-one of the agencies were telephoned to obtain descriptive information about certification processes. Those interviewed were asked questions about how criteria for eligibility and examination procedures were established, by whom, and with what results. Thus, the phone interviews obtained general information about these issues and descriptions of specific programs. Data other than that appearing in the literature on test content, validation, and other technical matters were considered proprietary and were unavailable for this study.

Assessment for Credentialing vs. Assessment for Job Selection

Assessment for credentialing has a different purpose than assessment for employment selection. Entry level credentialing criteria, especially for licensure, are based on judgments of what constitutes minimal competence necessary to protect the public from harm. In contrast, employers seek to identify people who will be either minimally or optimally competent to perform a job.

The certification process is not as job-specific as selection testing. In certification, a person's knowledge, skills, and abilities are assessed for a broad range of applications because, in many professions, this application can vary

tremendously depending on the job roles, levels, and settings. Problems in test validation arise because job performance outcomes--against which certification tests ideally should be validated--are more difficult to define for an entire profession than for a specific job. In contrast, an employer's selection tests can be designed for specific jobs, and performance in those jobs can be more easily measured.

When a person is selected for a job, typically there is no guarantee of job security. Performance outcomes on the job are more important than initial assessments. Certification, in contrast, provides a relatively permanent status to people regardless of job performance. In the past, this status could be carried from job to job throughout life without recertification, but this situation is gradually changing with some professions now requiring proof of continued competency.

Finally, the incentives for having high quality assessment mechanisms are different for employers, certification agencies, and professionals. Employers seek to assure productivity and profits; certification agencies seek to maintain professional standards and their control over entry to the occupation; professionals seek identity, status, job access, and mobility.

To appreciate fully the differences between competence assessment for awarding a credential and for employment selection, as well as to understand occupational credentialing with respect to such critical matters as job-relatedness and validity, requires an awareness of the historical, cultural, and

political context within which credentials have developed and are utilized.

A Context for Examining Credentialing:
Definitions, Motives, and Functions

Historically, people with special skills and capacities have sought recognition for their abilities, and consumers have sought ways to ascertain the quality of goods and services. Recognizing achievement and assuring at least minimally competent service are the basic functions of a credential. For this purpose, private and government certifying bodies have similar powers: They may influence quality of services, affect manpower supplies by controlling the number of professionals with credentials, and adopt strategies to protect professionals. In fact, their roles have become increasingly blurred as government's prerogatives have grown to overlap private activities in training, credentialing, selecting, and monitoring the performance of professional manpower.

This section will establish a context for examining the award of credentials in the context of the modern meaning of professionalism. A concise history of credentialing is provided as a background for the five basic motivations and functions of credentialing today. The section closes with an introduction to the issue of credentialing vis a vis social equity, since a major function of credentialing is classification and categorization of people in order to achieve an orderly society (White, 1977).

A Definition of Professionalism

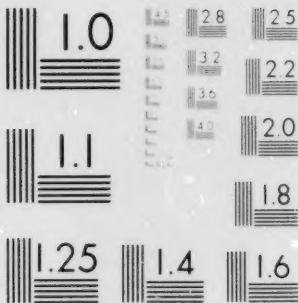
Friedson, a leading sociologist who studies the professions, has defined professionalism as:

...a process by which an organized occupation, usually but not always by virtue of making a claim to special esoteric competence and to concern for the quality of its work and its benefits to society, obtains the exclusive rights to perform a particular kind of work, control training for and access to it, and control the right of determining and evaluating the way the work is performed. (Friedson, 1973, p. 22)

The core of this definition is the control exerted by the profession and its members. That control extends to economic and social factors affecting professional employment as well as consumers of professional services and is the basis for the profession's power. The quality of labor and services provided by members of the profession is also involved in the issue of professionalism.

Becker (1970) has identified various criteria that determine whether an occupational group indeed comprises a profession, including whether:

1. The group has a monopoly on the specialized body of knowledge held by its members
2. That body of knowledge has a theoretical or philosophical basis articulated in some general principles
3. The profession controls entry into its ranks
4. All members of the profession are generally considered competent and otherwise qualified to practice it
5. The profession strives to appear altruistic in its efforts.²



MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

As the number of professions in contemporary society proliferates, these criteria may change. For example, it no longer appears necessary for a profession actually to exercise a monopoly over its body of knowledge. In fact, different professions incorporate the same portion of a body of knowledge and, indeed, compete for the right to apply it. Control over entry into the profession may be held not only by professional associations, but also by state licensing boards with some consumer membership, or by quasipublic organizations. Indeed, it may be most realistic to assume that the only functionally effective criteria for determining the existence of a profession is whether the occupation has a professional association with the main purpose of promoting the concerns of those who practice it. This definition of a profession is supported primarily by the increasing number of groups seeking professional status. For example, in the health care sector alone, the number of recognized professions is estimated at about 100 and growing rapidly.

As indicated at the outset, no meaningful difference between a profession and an occupation now exists: There is no way to keep a group from identifying itself as a profession. Professionalization has such substantial benefits and is so easily undertaken, that people tend to want to identify themselves as professionals no matter what their field of work. Even unionization of an occupation does not hinder it from identifying itself as a profession; unions are increasingly seeking white collar members.

Several causes have combined to create more professions in recent years: the growing complexity of modern life, competition in an economy that is increasingly service-based, and specialization of knowledge in the latter twentieth century. The proliferation of professions in turn has had both positive and negative effects, a number of which will be described later in this chapter.

Professions and Regulation: A Brief History*

Regulation of professions may be traced back to medieval times when guilds were formed by European municipalities to protect their merchants, craftsmen, and learned professionals from competition. Membership was compulsory and difficult to achieve. In time, guilds totally controlled the manner and methods of members' practice. In the New World, the colonists were vitally concerned with increasing the number of professionals--even if minimally-skilled--consequently they made few attempts at regulating professionals until well after the mid-1700s. Following the Revolutionary War, attempts to regulate occupations began: they are well illustrated by the experience of the medical profession. Presaging modern practices of certification and accreditation, state medical societies were authorized to examine and license professionals, and to charter medical schools which would qualify their graduates for

*See Appendix A for an expanded history.

licensure (Council of State Governments, 1952).

During the mid-1800s, the competition among practitioners of diverse and newly emerging medical theories combined with a pervasive antiregulation sentiment in society to nullify previous regulatory efforts. Virtually anyone at that time could enter the medical profession unimpeded. Reminiscent of the formation of the guilds, the rise of strong professional associations (e.g., the American Medical Association, (AMA)), based on allopathic medicine, and the subsequent emergence of associations based on specialty practice eventually thwarted competition from practitioners without credentials (Stevens, 1973).

Professional associations gained strength partly through emphasis on increasing the quality of practice. Out of its concern for quality assurance, the AMA supported state regulation including medical examining boards whose members were often nominated by local medical societies and state counterparts to the AMA. A great impetus for improving medical care quality came with the publication of Abraham Flexner's report, Medical Education in the United States and Canada, in 1910. Standards rapidly adopted to upgrade medical education resulted in numerous school closings and significant reductions in the number of practicing physicians (Lieberman, 1970).

The search for excellence in the profession continues today. In recent years, many states, at the direct urging of state professional associations, have amended their original

laws from title acts to stricter practice acts (Hogan, 1979). This raising of standards has been accompanied by a shift from certification and registration to compulsory licensing (Council of State Governments, 1952).

As of 1950, 75 occupations were licensed in one or more states, with 13 occupations licensed in all states (Council of State Governments, 1952). By 1969, the number of licensed occupations had reached 500, with nearly 5,000 different types of licenses being granted across the country (U.S. Department of Labor, 1969). In the health field, by 1970, 30 different health occupations required licensure in one or more states, with 12 health professions regulated in all states (U.S. Department of Health, Education, and Welfare, 1971). Nearly 30 new licensure laws were enacted in the health field in 1974 (U.S. Department of Health, Education and Welfare, 1975). The result is that licensing laws now directly affect approximately one-fifth to one-third of the workforce (Behavior Today, 1976).

How Professions Emerge Today

The following series of steps has been identified as the sequence through which groups pass as they obtain professional status (Wilensky, 1964).

Work Patterns

In earlier times, the unit of industry was a single person who offered services. Today, it is common practice for an

employer to hire an individual to perform a series of tasks in a unique combination or under given circumstances, or to delegate certain of the employer's tasks to the employee. For example, dentistry, which originally relied on a profession-to-client, one-on-one practice, recently has begun to rely on so-called "four-handed practice," in which nondentists assist in direct patient care. Thus, a new profession of dental assistants has emerged to take on certain delegated tasks. Pressure to develop a new professional group may start with government, clients, or enterprising consumers.³ But in all cases, the rise of a profession begins with the existence of a job or role to play in the economy. In the case of dental assistants, that role is to assist or assume some of the professional's tasks.

Education and Training

Education and training programs appear as soon as a consensus emerges among members of the profession, or those benefiting from it, that a particular body of knowledge and skills is required to perform the job adequately. In some professions, an undergraduate degree or even a postgraduate degree is deemed prerequisite, and therefore training programs are likely to be located in universities. Other credentialing programs require so little advance preparation and take so little time to complete that they can be located on or near the job site.

In some cases, the emergence of educational programs may

create a tension in a new profession between those members who started out prior to the development of training programs and those who went through a prescribed curriculum and graduated from an accredited program. Tension sometimes occurs between older and younger members of a profession, between the less and more formally educated, or between the less and more specialized. The resulting stresses strongly influence the development of professional associations and can lead to fragmentation in a profession at an early stage. Conceivably, such stresses also can test whether a new group has enough cohesion to achieve and then maintain professional status; for example, the survival of nurse practitioners (nurses with extra capabilities) as an identifiable profession is by no means assured at this time.

Professional Associations

A professional association can emerge under the sponsorship of another professional association or in competition with an organization that purports to be the representative of the vast majority of members of a new profession. The role of a sponsoring association can be key in the development of so-called paraprofessionals or dependent groups. (The term "paraprofessional" evokes the limited expertise of the new profession and its lack of independence from the supervising profession.) Rival organizations are likely to emerge where different occupational backgrounds or different types of work settings are appropriate for the same general job, generating

great confusion and threatening the viability of the profession. An outstanding example is nuclear medicine, which currently uses three different credentialing mechanisms developed variously by nuclear medicine technicians, pathologists, and radiation therapists.

Formation of a professional association accords a new profession visibility and credibility in society by means of the association's political and educational activities. Association lobbyists promote the profession's views; selected members are recognized externally as leaders in the field; annual meetings, seminars, lectures, and specialty journals inform members of intellectual developments and pertinent regulatory actions.

Certification and Licensure

Until recent years, licensure alone was considered the essential mechanism for legally recognizing a profession. Today, the trend is for certification by the profession itself to be at least as important as licensure in regulating entry into the profession. Licensure and certification usually exist simultaneously. Licensure, however, tends to rely very heavily on the examinations and criteria for professional membership developed by the certification bodies. A major advantage of this trend is that certification is usually national in scope thus, differing state standards and qualifications do not inhibit the mobility of a profession's members. A weakness of both licensure and certification to date is that they

concentrate on whom to admit to a profession rather than how well the same people perform once they are in it (Hogan, 1979; Shimberg, Esser, & Kruger, 1973). Frequently, either certification or licensure is required for reimbursement for professional services rendered. These criteria for payment reflect membership as much as quality of service.

Because of their dependence on the certification process, both state and federal governments are increasingly involved in establishing a framework for certification mechanisms and monitoring the subsequent performance of the system. Many of the costs and benefits of state regulation* also characterize private mechanisms of credentialing. In fact, except for the goal of public accountability, private mechanisms may be just as effective and perhaps more effective than public mechanisms.

Ethics

Professional ethics usually protect both the members of a profession and the public it serves. In the past, one of the major tenets of codes of ethics has been regulation of advertising. Proscriptions against mass media advertising by practitioners, however, are no longer considered constitutionally permissible.⁴ Codes of ethics that have set minimum fees and in other ways have regulated pricing by professions are also under legal attack and are generally considered to violate

*See Appendix B for a list of these for the health profession.

federal and state antitrust laws.⁵ Recently, consumer protection statutes have tended to reduce the need for codes of ethics designed to protect the public. Professional codes of ethics continue to be important, however, where consumer protection statutes exempt the conduct of regulated professions.

Credentialing: Motivations and Functions

The credential requirement attempts to provide quality assurance by controlling the input of background, skill, and experience brought to a job. It therefore differs from efforts to regulate the process of service delivery and from judgments, like malpractice verdicts, based on outcomes of service. The assumption underlying requirements for professional credentials is that the input of individual competence has a significant impact on both process and outcome of service.

The many motivations that prompt efforts to establish competence by means of some process leading to a credential vary with purpose and the given situation. For example, a corporation, by certifying that an employee has completed a training course, both recognizes employee efforts and provides an incentive for other employees to improve their skills and obtain recognition. Motivations to protect public safety, control job access, or control quality of services are peripheral to this type of credentialing. The motivations for credentialing may be explicit or implicit. Discrepancies often exist

between those that are publicly stated and those privately adhered to.

The following section describes five basic motives for granting a credential, how they function now, how they would function ideally, and how the motives affect the activities of public and private credentialing bodies. The first three motivations: (1) self-fulfilment and special recognition; (2) upgrading the profession; and (3) public education are more pertinent to certification than to licensure.

Self-Fulfilment and Special Recognition

The self-fulfilment function of certification can sometimes be served by little more than a testimonial that an individual has completed a course of training or met some standard of performance that is held in esteem by the certified individual, his or her colleagues, or employers. Employers or professional associations might recognize activities an individual undertakes for self-fulfilment if such recognition is liable to foster high morale, loyalty, or productivity.

Numerous attempts have been made by educational institutions, industries, and the public service sectors to promote the self-fulfilment of individuals. They range from non-rigorous incentives (e.g., certificates of attendance, course completion, or meeting a production goal) to more formal, nationally visible incentives. For example, our survey revealed that the National Association of Certified Travel Agents

certifies those agents who have five years of experience in retail and sales management as travel consultants. Applicants for certification must document that they are financially solvent and free of gross legal misbehavior, they must write a research paper, and must complete an essay exam covering issues of business management, sales management, marketing, and domestic and international tourism.

Because the majority of certification functions determine only who is minimally competent to serve the public without doing harm, there is also a need for certifying advanced levels of achievement. Advanced certification activities range from those that are primarily for self-fulfilment to those that clearly affect a person's job opportunities and financial well-being. For example, medical specialty board exams are not required by law, but nearly all employers and hospitals require them. Income potential, status, and power are directly linked to possession of these certificates and determine the continued desirability of seeking them.

Upgrading the Profession

There are both public-interest and self-interest reasons for upgrading the profession. The former involves providing the public with the best quality of services that reasonably can be achieved. The latter involves upgrading for the sake of capturing more of the market, limiting entry, and protecting the profession against competition by establishing a monopoly.

Activities to upgrade the profession ideally would include accurate analysis of public needs for the protection of certification requirements and setting standards based on these data. In the worst case, standards would be based exclusively on opinions about what is best for the public according to the parochial interests of professionals. Although there are probably no professions that operate at either extreme, there is strong evidence that the professions operate more toward the self-protection end of the spectrum (Hogan, 1979). The professions' and the public's needs overlap greatly toward the center of this spectrum. Increased activity by federal regulators, state legislators, consumer groups and national standard-setting bodies is directed toward establishing a balance of interests and reflects the growing national concern about the purposes of professions' attempts to increase requirements for membership.

Public Education

The public education function of certification is almost universal, and is based on the belief that a consuming public that understands the meaning of certification will be better informed to make wise selections of services. For example, we found in our survey that automobile mechanics conduct a certification program with public education as its major purpose. Certification in this instance is not tied to employment or to state licensing but is provided to enable consumers to choose

mechanics that meet publicly stated criteria for excellence. This approach would function optimally, nonetheless, only in an open market where consumers had ample and accurate information about the meaning of the certificate with respect to competence and an abundance of service providers from whom to choose.

The most effective public information efforts consist of widely disseminated, accurate, and useful information about what certification means in terms of the education, experience, and competence of professionals. Information might be provided about how to select a professional wisely. There could also be voluntary public disclosure of individuals' education, training, and some record of performance. Finally, there might also be public disclosure regarding professionals found guilty of gross negligence, fraud, or other job-related misbehavior. We found no examples of certification systems that promote public education to this extent. The more usual activity is traditional public relations (Barzun, 1978).

Public Protection

Public protection is most often cited as the essential purpose of credentialing. Nearly every activity of a certifying agency can be related to the public protection function. The establishment of eligibility requirements and assessment procedures, public education, performance auditing, and enforcement of legal and ethical standards, to name a few major

certification organization activities, all affect the quality of service delivery and hence public protection. The rigor with which these activities are carried out varies within and across professions.

The central purpose of the government's involvement with credentialing is to provide assurance that professional services meet minimal standards.⁶ Historically, this assurance has been provided through actual state participation in licensure. In this century, as the importance of training programs in the delivery of professional services increased, state licensing boards and the Federal Office of Education began to assume authority over the accreditation of educational institutions and training programs for licensed professionals. The federal influence is gradually increasing in the area of credentialing. For example, federal financing of health care requires a means of recognizing those professionals eligible for payment for their services. As yet, there is insufficient case law to determine just how far the Constitution permits federal intrusion into the area of licensure (Blumstein & Calvani, 1978).

According to California's Department of Consumer Affairs, the public welfare purpose of licensing laws is:

to protect the public from fraud and incompetent or unethical practitioners. Positively stated, licensing is intended to insure honest and competent services by people engaged in various occupations and professions. Licensing is also meant to offer a mechanism by which to police a trade or profession and a swift means of redress for aggrieved members of the public. (Haberfeld, Saxby, & Schletter, 1978, p. A-8)

States attempt to assure competence through initial licensure and continued monitoring of licensees, although enforcement of standards has frequently been inadequate. The state's licensing laws define scope of practice and specify "requirements of character, education and training" which are often reflected in requirements for graduation from approved educational institutions and for examination scores that prospective licensees must meet. Licensing agencies established by a state, "usually composed of licensed and practicing members of the industry to be regulated," enforce these standards and those pertaining to continued licensure (Haberfeld, Saxby, & Schletter, 1978).

States usually delegate the task of developing licensing examination procedures to boards of practitioners or academicians. The standards set and the choice of people to set them can be controversial as these become political issues rather than scientific or empirical ones.

Control of the Labor Supply

Controlling the labor supply by means of credentials has tremendous social, political, and economic implications. Nevertheless, it is rarely openly acknowledged.⁷ Many professions have achieved enactment of state scope-of-practice laws that broadly define the activities that can be carried out by a single profession (usually with several exemptions to other "qualified" professions such as private practice doctors

delegating blood pressure checks to nurses). Thus, a profession can force consumers to purchase only its services.

Eligibility requirements can be used to produce unfair limitations on access to employment opportunities. Rigid entry qualifications can affect the demographic character of a profession more than the quality of services rendered, especially in less technical professions where knowledge and skills can be learned relatively easily or over a relatively brief period. For example, restricting access to a job on the basis of an educational credential may restrict access of minority applicants who may be competent but, de facto, tend to lack the credential.

Historically, licensure laws have not been imposed upon occupations due to public concern over existing or imagined abuses. Rather, they are sought for protection by the very groups who are to be subject to them. Occupational groups desire legal sanction to achieve enhanced status and competitive economic advantages by attaining certain monopoly goals.⁸ But at the same time, they risk legal challenge. The fundamental theory of antitrust is that the public suffers by having to pay higher prices when service providers restrict supply or control pricing behavior.

Increasingly, individuals who have been denied access to occupations or professions have sought redress through the courts. In challenging the use of credentialing requirements alleged to be unduly burdensome or discriminatory, plaintiffs

have frequently resorted to Title VII of the Civil Rights Act of 1964, federal antitrust laws, and the constitutional right of due process. Although certification is technically a voluntary process, significant advantage and benefit are denied those practitioners who do not have access to certification. Many state licensing laws grant significant privileges to certified individuals and many employers routinely reject applications from those who are not certified.

Current certification practices might be vulnerable to antitrust challenge; for example, a case currently being litigated⁹ questions whether a certifying organization's test requirements for applicants violate the Sherman Anti-trust Act. In this case, the National Board of Respiratory Therapy, the American Association of Respiratory Therapy, and several hospitals in the Chicago area are charged with refusing to hire people unless they successfully complete the certification examination. It is alleged that the tests have never been validated and exclude a disproportionate number of blacks and Hispanics. This case may become a significant precedent relating to the relationship of certificate examination to actual practice skills and the ability of employers to refuse to hire noncertified applicants. Further legal challenges to such practices may be expected. Some state courts, too, have come to examine closely the state-sanctioned power of professional groups to limit access to employment opportunities.¹⁰ Meanwhile, under a series of federal laws, the Department of

Justice and the Federal Trade Commission (FTC) are increasing their attempts to prevent price fixing and certain trade restraining activities on the part of combinations of professionals.

Recent FTC investigations of the professions including medical doctors, dentists, optometrists, funeral directors, veterinarians, pharmacists, and accountants have sought to determine the extent to which self-regulatory initiatives, such as codes of ethics prohibiting advertising of professional services, deprive consumers of information needed to make rational purchasing decisions. Evidence that the agency has struck a sensitive chord has been apparent in congressional attempts to curtail further FTC work in these areas. Recent and related Department of Justice activity includes a successful antitrust challenge to competitive bidding bans imposed by the Texas State Board of Public Accountancy.¹¹

The increasing interdependence and specialization among professions, particularly in the health care area, have been powerful tools for controlling unorthodox and innovative professional services (Havighurst, 1978). While little can be done to prevent individual practitioners from refusing to refer patients to practitioners who offer nontraditional modes of service delivery, in several instances medical society prohibitions against members accepting referrals from group practice physicians have been subject to successful antitrust attack.

At the heart of much of the recent FTC activity is a desire to alter practitioners' perceptions of what constitutes professional practice. By seeking to dismantle bans against advertising,¹² the Commission is seeking nothing less than a redefinition of what is considered competent, ethical practice. Related to the promotion of competition in the interest of consumers is the increasingly common role of government as a major, vigilant consumer of services. Government auditing alone can serve to limit professional freedom of action. For example, the government consumer will establish maximum fees that it is willing to pay for professional services; this is likely to produce great impact on professionals who are accustomed to controlling their own fee schedules.

Tensions between private and public credentialing are growing. As the government takes more seriously its role in protecting the public, the knowledge and technical expertise required to define scopes of practice and standards of performance still reside with the private sector.

Equity and Sociocultural Considerations

Certification seems to stratify individuals along dimensions of power, status, potential, and economic attainment and thus plays a crucial role in social classification. Mechanisms used to assess individual competence change with altered social and cultural circumstances. Our society still subscribes to the notion of allocating social benefits and status on the

basis of merit, although our definitions and criteria for determining merit continue to change.

At the turn of the century, meritocracy was defined in the terms of Social Darwinism: "bestness was intelligence" (White, 1977, p. 38). Thus, intelligence testing became central to the allocation of opportunities during the early part of this century. But intelligence testing exploded into public acceptability and use not because of its scientific merits, but because it could be seized on as part of a more fair and more just system of social contracts. The test could be used as part of the system for allocating social opportunity (White, 1977). The emphasis on educational and intellectual attainment, which resulted in a "schooling scheme" for classifying citizens, began to falter as access to educational opportunities became more universally available and past assumptions about the positive relationships between education, work, and life experience came into question for lack of empirical verification (McClelland, 1973). Only recently has there been widespread attention to the inherent discriminatory effects of intelligence tests which reflect and perpetuate the social philosophies of the dominant social groups that design them. Nevertheless, most contemporary certification programs rely heavily on assessments of individual abilities by means of tests that measure only a narrow spectrum of attributes that are not necessarily the ones most relevant to competent performance. (This will be discussed further in a subsequent

section of this paper.) A more positive approach might be to shift away from the concept of intelligence or academic achievement toward the concept of competence or the "ability to do," as espoused by competency-based education programs. Competence embodies qualities and consequences of performance in addition to intellectual or cognitive skills.

As it has become apparent that the opportunities for professionalization are finite, that not everyone will be able to use professionalization to enhance their occupational status and economic position, government has begun to act to assure that professional opportunities are fairly allocated. For the past 20 years in the United States, efforts have been directed primarily toward protecting minorities and women. The theory is that where professional opportunities are open to all applicants, eventually some degree of proportionate representation can be achieved. However, credentialing turns on assessments of competence; and competence depends on educational opportunities, previous work opportunities, and a person's overall participation in the mainstream of society. Education is especially important, not only to acquire the knowledge prerequisite to entry into a profession, but also to acquire test-taking skills without which the opportunity to enter a profession is diminished.

To facilitate economic mobility, so-called "alternate pathways" (described more fully in Section III of this chapter) have been laid out so that an individual can meet

qualifications for entry into a profession partly on the basis of previous job-related experiences rather than solely through fulfilling a lengthy course of study and educational achievement. Questions of equity are implicit in the ensuing discussions regarding the design, construction, and utilization of various credentialing mechanisms.

NOTES TO SECTION I

¹A Third type of state regulatory legislation, registration, is not specifically discussed in this paper, although sometimes discussed in other sources. Registration is a legal process of credentialing that differs from certification or licensing in that it typically does not demand successful completion of education, examination, or other restrictive requirements.

²Other criteria that commonly have been used to identify a profession include whether: it constitutes a full-time occupation; its members have a strong motivation or calling; the specialized body of knowledge and skills held by the members is acquired during prolonged education and training; practice of the profession is predicated on some determination of client needs; or members possess autonomy of judgment.

³Frequently the central mission of professionalization is to meet a public need. To illustrate, a public need for a recognized professional group to perform functions of rescue services (including the driving of ambulances) became quite apparent in recent years. Professionalization meets a public need in this case because it increases training. Sixty-five percent of currently certified emergency vehicle technicians, are volunteers, hence this motivation for professionalization is not for monetary reward.

⁴Virginia State Board of Pharmacy v. Virginia Citizens Consumer Council, Inc., 425 U.S. 748 (1976).

⁵Bates v. State Bar of Arizona, 433 U.S. 350 (1977).

⁶Aside from credentialing, government has other means to assure professional competence. One is direct regulation, as is done for certain services strongly associated with the public sector such as public transportation, sanitation, education, and law. Another is after-the-fact control through malpractice litigation.

⁷The justification of this function is that, if there were no restrictions on access to a profession unrelated to competency, competition would result in lower prices and make it impossible for members to maintain a decent standard of living. Professions apply this logic to their own situation with varying degrees of openness.

⁸These goals ". . . [assure the trade's] ability to both protect itself against competition from outsiders and to maintain high consumer prices for its services. Such control is offered an industry group if it can require that a government agency be established to bar from practice would-be practitioners who fail to meet the entry qualifications established by the trade group. Further control over competition is achieved when the state agrees to allow this agency to be composed (of) or dominated by members of the regulated industry. Power is complete when these trade-dominated administrative agencies are endowed with broad rulemaking and enforcement or

disciplinary functions." (Haberfeld, Saxby, & Schletter, 1978, p. A-13)

⁹Veizaga v. National Board for Respiratory Therapy, 1977-1 Trade Cases (CHH), Par. 61, 274 (N.D. Ill., 1977).

¹⁰" . . . this power of exclusion of fellow workers in the same field . . . gives to the subject its social significance, and invites our most serious consideration of the constitutional guarantees of personal liberty and individual right called to our attention . . ." (Barron, 1966, p. 657 in Haberfeld, Saxby, & Schletter, 1978, p. A-14).

¹¹United States v. Texas State Board of Public Accountancy, 464 F. Supp. 400 (W.D. Texas, 1978), modified, 592 F. 2d 919 (5th Cir., 1979).

¹²The Federal Trade Commission has ruled that the American Medical Association can no longer prohibit medical doctors from advertising their fees and services (FTC Docket 9064, Dec. 22, 1975).

II. CREDENTIALING SYSTEM: DESIGN, CONSTRUCTION, AND UTILIZATION

Occupational credentialing systems serve five major functions. Designers of credentialing procedures should, therefore, recognize their functions and attempt to do the following:

1. Define the roles, functions, activities, and tasks of the job
2. Determine the characteristics (knowledge, skills, attitudes) workers must have in order to carry out the job
3. Determine ways to assess these characteristics
4. Validate their procedures
5. Assure continued competence

Each of these five functions can be performed in different ways, and the resulting credentialing procedures may have low to high proximity to competence required for performance. These relationships are diagramed in Figure 1.

Ideally, a certification system would begin with a systematic analysis of competence that would identify and define affective, behavioral, and knowledge components of competence. The analysis would assess results of performance on the job from the perspective of clients or others affected by worker behavior and attitudes. At a minimum, proxies for assessment (e.g., educational credentials) would be directly related to

FIGURE 1
Dimensions and Approaches to Job Certification

APPROXIMATION TO THE IDEAL

	Low (1)	Moderate (2)	High (3)
Identification and Definition of Competencies	"Armchair" Theory	Task Analyses ● Job Characteristics	Competence Analyses ● Personal Characteristics
Assessment of Competence	Inputs ● Eligibility Requirements ● Educational Credentials ● Knowledge Tests	Processes ● Work Samples ● Simulation Tests	Outcomes Criterion Measures: ● Performance Appraisals ● Client Outcome Measures
Validity	Face Validity	Content Validity	Predictive Validity

-3.36-

outcome measures. No existing certification system combines all of these approaches, and although this ideal is a useful reference point, this chapter focuses more on the current state of the practice.

Some certification systems have moderate proximity to competence, but these are the exception. They are based on analyses of job tasks with little or no consideration of the personal characteristics of individuals which enable them to perform these tasks well. These systems measure simulated performance in artificial, highly controlled, and limited conditions. The procedures for assessing competence are based on the subjective opinions of a relatively limited number of experts who assert that the content of the procedure is a representative sample of the job competence domain.

In the remainder of cases, certification has a low proximity to job competence. Only basic knowledge related to the job is measured, and analysis of what constitutes competence seldom involves more than "roundtable" discussions and the synthesis of experts' armchair opinions. These assessments document some of the abilities candidates bring to the job but not whether they possess other characteristics that will enable them to apply these abilities to bring about positive outcomes. Finally, these procedures for assessing competence are face valid on the basis of seemingly common sense judgments about their relationships to job requirements.

Results of the Review

Tables 1 and 2 summarize the results of a review of occupations and certifying agencies conducted for this chapter, and they show a wide range of possible approaches to certification, along the dimensions just discussed: the kinds of characteristics assessed, the assessment tools used, and the validation methods employed. Both descriptive and qualitative information was obtained during telephone interviews with officials from 21 of these organizations. As described earlier, the sample was not randomly selected. Therefore, statements about the state of the practice in awarding occupational credentials which appear in the remainder of this section are based upon analysis of the literature, as well as the information obtained from the study sample.

Defining the Job and Determining the Personal Characteristics Required

The process culminating in the granting of a credential logically begins with an identification of occupational roles and tasks, and the knowledge, skills, abilities, and other characteristics necessary for competent occupational performance of those tasks. In practice, this identification can be achieved through means as varied as experts' opinions based on armchair reflections, expert analyses of formal surveys of job tasks and functions, or analyses of personal characteristics that differentiate superior from average job performers.

Certification Eligibility Requirements

Occupation	Organization or Certifying Agency	Education	Work Experience	Internship/ Practicum	Examination
Accountant	Am. Inst. of CPA's	B.A.	Varies	--	LWR; E
Audiology:					
Audiologist	Am. Hearing & Speech Association	M.A.	--	9 mos.	LWR
Speech Pathologist	"	M.A.	--	--	LWR
Automotive:					
Automobile Service	Nat. Inst. for Auto- motive Excellence	3 yrs. H.S. level train- ing may substitute for 1 yr. exp.; 2 yrs. post H.S. may sub. for 1 yr. exp.*	2 yrs. hands-on exp.	3-4 yr. appren- ticeship may sub. for exp.*	LWR
Body & Paint	"		"		LWR
Heavy-duty Truck	"		"		LWR
Cardiology Technician	Am. Card. Tech. Assn.	H.S.	2 yrs.	--	LWR
Child Dev. Associate	Child Development Associate Consortium	Early child dev. college courses	8 mos. full-time or 16 mos. part- time	--	Pra; E; Or
Child Health Associate	Child Health Associate Program	B.A./B.S. or M.S. in Child Health + 2 yr. program	--	1 yr.	LWR
Chiropractor	Nat. Board of Chiro- practic Examiners	"Ph.D." from approved chiropractic school	--	--	LWR
Clinical Hypnotist	Am. Board of Clinical Hypnosis	Ph.D.	Post-doctoral	3 yrs. super- vised	None
Corrective Therapist	Am. Corrective Therapy Assn.	B.A./B.S. + clinical training	--	400 hours	LWR; Or
Cosmetologist	Interstate Council of State Boards of Cosm,	Min. 6 mos. in accred- ited school	--	--	LWR; Pra

See Key at end of Table

Occupation	Organization or Certifying Agency	Education	Work Experience	Internship/ Practicum	Examination
Cytotechnologist	Board of Registry - Am. Soc. of Clinical Pathologists	AA or 30 college hrs. + CAHEA ¹ accred. pro- gram	--	--	LWR; Pra
Dental Assistant	Am. Dental Asst. Assn.	If includes practicum may sub. for exp.*	Any length	Any length may sub. for work exp.*	LWR
Dental Assistant	Am. Assn. of Medical Personnel	B.A./B.S. or AAMP approved prof. school	2 yrs.	--	LWR
Dental Hygienist	(A.D.A.) Nat. Board Examinations	Accredited dental hygiene program	--	--	LWR
Dental Lab. Tech.	Nat. Board for Certif. in Dental Technology	H.S. or equivalent	5 yrs. (may com- bine education & experience	--	LWR; Pra
Dietician	Am. Dietician Assn.	B.A./B.S.	--	6-12 mos.	LWR
Emergency Medicine:					
E.M.T. - Basic	Nat'l Registry of Emerg. Med. Technicians	81 hrs. in approved program	6 mos. ambulance rescue service	--	LWR; Pra
E.M.T. - Paramedic	"	410 hrs. in CAHEA ¹ approved program	"	1 CC hour	LWR
Engineering Technician	Institute for Cert. of of Eng. Technicians	None for entry level	--	--	LWR
Engineering Technologist	"	"	--	--	LWR
Gnathologic Orthopedist	Am. Acad. of Gnathologic Orthopedics	Attendance at 3 3-day training sessions	5 completed cases over 3 yrs	--	E
Histologic Technician	Bd. of Registry - Am. Soc. of Clinical Path- ologists	H.S. AA or 60 hrs. college or CAHEA ¹ program	2 yrs. 1 yr.	--	LWR; Pra
Med. Assistant	Am. Assn. of Medical Personnel	B.A./B.S. + approved school	2 yrs.	--	LWR

Occupation	Organization or Certifying Agency	Education	Work Experience	Internship/ Practicum	Examination
Med. Lab. Technician	Am. Assn. of Medical Personnel	AA in Med. Tech.; <u>or</u> AAMP approved hospital training course	3 yrs. may sub. for Educ./Prac.*	1 yr.	LWR
Med. Records Tech.	Am. Medical Records Assn.	AA in AMA/AMRA accred- ited program	--	Incorporated in curriculum	LWR
Med. Records Adm.	"	B.A./B.S. in AMA/AMRA accredited program	--	"	LWR
Med. Secretary	Am. Assn. of Medical Personnel	B.A./B.S. or AAMP approved prof. school	3 yrs.	--	LWR
Med. Technologist	Board of Registry - Am. Soc. of Clinical Pathologists	B.A./B.S. w/required courses <u>or</u> accred. pro- gram or cert.	3-4 yrs. 5 yrs. may sub.*	--	LWR
Microbiologist	Am. Soc. for Micro- biology	B.A./B.S. or M.A./M.S.	1-4 yrs.	--	LWR
Nurse Anesthetist	Council on Certification of Nurse Anesthetists	B.A./B.S. or M.A. in accred. program or 2 yr. accredited program	--	Part of program	LWR
Nursing Home Adm.	Am. College of Nursing Home Administrators	H.S. or equivalent	2 yrs.	--	LWR; Pra; Or; CS
Nursing:					
Child/Adolescent	Am. Nursing Assn.	--	2 out of last 3 yrs.	--	LWR
Pediatric Nurse Pract.	"	Approved course of study	--	--	LWR
Medical/Surgical	"	--	2 out of last 3 yrs.; 16 hrs./ wk.	--	LWR
Med./Surg. Clin. Spec.	"	M.A. w/concentration in nursing	1 yr; 4 hrs./wk.	--	LWR
Psy. or Mental Health	"	--	2 out of last 4 yrs.; 4 hrs./ wk.	--	LWR

See Key at end of Table

Occupation	Organization or Certifying Agency	Education	Work Experience	Internship/ Practicum	Examination
Psychiatric & Mental Health Clinical Spec- ialist	Am. Nursing Assn.	M.A. w/concentration in specialty area	2 yrs. of 8 hrs/ wk.; or 4 yrs. of 4 hrs./wk.	1 yr.	LWR
Adult and Family Nurse Practitioner	"	B.A./B.S. or M.A. meet- ing ANA guidelines	--	--	LWR
School Nurse Prac- titioner	"	"	--	--	LWR
Gerontological Nurse	"	Approved program	--	--	LWR
Nursing Adm.	"	--	24 mos. in last 5 yrs. in adm.; currently mid- manage. or exec. adm. position	--	LWR
Occupational Therapist	Am. O.T. Assn.	Accredited or approved O.T. school	6 mos. under supervision of cert. therapist	--	LWR
Optician	Opticians Assn. of America	--	--	--	LWR
Ophthalmologist	Am. Board of Ophthalmol- ogy	"Ph.D."	--	Board approved residency train- ing program	LWR; OR
Oral & Maxillo-Facial Surgeon	Am. Board of Oral & Max- illofacial Surgery	M.S. + Board approved training	1 yr.	--	LWR; Or
Orthodontist	Am. Board of Orthodon- tics	M.A.	5 yrs.	2 yrs.	LWR; Or
Pedodontist	Am. Board of Pedodontics	B.A./B.S. + 2 yr. approved program	3 yrs.	2 yrs.	LWR; Or; Pra
Periodontologist	Am. Board of Periodon- tology	Ph.D. + accredited program	2 yrs.	--	LWR; Or
Pharmacist	National Assn. of Boards of Pharmacy	Grad. Am. Co. Phar. Ed. accredited 5 yr. college of pharmacy	--	1500 hrs.	LWR

See Key at end of Table

Occupation	Organization or Certifying Agency	Education	Work Experience	Internship/ Practicum	Examination
Physicians Assistant	Nat'l Comm. on Cert. of Physicians Assts.	AMA accredited training program	4 yrs.	--	LWR; Or; Pra; CS
Podiatric Asst.	Am. Society of Podiatric Assistants	--	1 yr.	--	LWR
Practical Nurse	Nat'l Assn. for Prac- tical Nurse Education and Service	B.A./B.S. + state license	1 yr.	--	LWR; Pra
Psychological Hypnotist	Am. Board of Psy. Hyp- nosis	Ph.D. + 60 hrs. spec- ialty training courses	5 yrs.	2 yrs.	Or; Pra
Radiologic Technician	Am. Registry of Radio- logic Technicians	24 mos., AMA approved	--	--	LWR (1980)
Radiation Therapy Tech- nician	"	"	--	--	LWR
Nuclear Med. Technician	"	"	--	--	LWR
Spec. in Chemistry	Board of Registry - Am. Soc. of Clinical Path- ologists	B.A./B.S. + M.T. cert. M.A. Ph.D.	5 yrs. 4 yrs. 2 yrs.	--	LWR
Spec. in Hematology	"	" Same as spec. in Chem.	"	--	LWR
Spec. in Immunology	"	"	"	--	LWR
Spec. in Neurobiology	"	"	"	--	LWR
Surgical Trade	Am. Surgical Trade Foun- dation	M.S. + 40 hrs. theory	2 yrs.	--	LWR; Pra
Technologist in Chemistry	Board of Registry - Am. Soc. of Clinical Path- ologists	B.A./B.S. w/required courses	1 yr.	--	LWR
Tech. in Hematology	"	B.A./B.S. + M.T. cert.	1-2 yrs.	--	LWR
Tech. in Immunology	"	"	"	--	LWR
Tech. in Microbiology	"	B.A./B.S.	1 yr.	--	LWR

See Key at end of Table

Occupation	Organization or Certifying Agency	Education	Work Experience	Internship/ Practicum	Examination
Tech. in Nuclear Medicine	Board of Registry - Am. Soc. of Clinical Path- ologists	H.S. + CAHEA ¹ prog. AA/60 hrs. + CAHEA ¹ program B.A./B.S. + CAHEA ¹ prog. MT or RT certificate	6 yrs. 3 yrs. 2 yrs. 1 yr.	--	LWR
T.V. & Radio Svc.	Nat'l Alliance for T.V. & Electronic Service	--	--	--	LWR
Travel Agent	Institute for Cert. Travel Agents	--	5 yrs.; 3 yrs. in retail agen- cy; 2 yrs. in sales	--	E

* Indicates possible substitution across categories.

KEY:

- Ph.D. - doctorate degree
- B.A./B.S. - baccalaureate degree
- H.S. - high school diploma
- M.A./M.S. - master's degree
- AA - associate degree
- LWR - Limited Written Response (multiple choice, etc.)
- Pra - Practical
- Or - Oral
- E - Essay
- CS - Simulation
- ¹CAHEA - Commission on Allied Health Education and
Accreditation of the American Medical Association

Examination Design and Construction

Occupation	Organization or Certifying Agency	Competence	Who Designs	Norm/Criterion Referencing
Accountant	Am. Inst. of CPA's	EC	IH	CR + NR
Audiology:				
Audiologist	Am. Hearing and Speech Assn.	EC	OC	NR
Speech Pathologist	"	EC	OC	NR
Automotive:				
Automobile Service	Nat'l Inst. for Automotive Excellence	EC	OC	NR
Body & Paint	"	EC	OC	NR
Heavy-duty Truck	"	EC	OC	NR
Cardiology Technician	Am. Card. Tech. Assn.	EC	IH	CR
Child Dev. Associate	Child Development Associate Consortium	TA, EC	IHPA	CR
Child Health Associate	Child Health Associate Program	EC	IH	CR
Chiropractor	Nat'l Board of Chiropractic Examiners	EC	IHPA	NR
Corrective Therapist	Am. Corrective Therapy Assn.	EC	IH	--
Cosmetologist	Interstate Council of State Boards of Cosmetology	EC	OC	NR
Cytotechnologist	Board of Registry - Am. Soc. of Clinical Pathologists	EC	IH	NR + CR
Dental Assistant	Am. Dental Assistant Assn.	TA, EC	IH	NR
Dental Assistant	Am. Assn. of Medical Personnel	EC	IH	CR
Dental Hygienist	(A.D.A.) Nat'l Board Examinations	EC	IH	NR
Dental Lab Technician	Nat'l Board for Cert. in Dental Technology	EC	IHPA	CR
Dietician	American Dietician Assn.	EC	IHPA	CR

See Key at end of Table

Occupation	Organization or Certifying Agency	Competence	Who Designs	Norm/Criterion Referencing
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Emergency Medicine:

E.M.T. - Basic

Nat'l Registry of Emerg. Med. Tech.

TA, EC

IHPA

NR

E.M.T. - Paramedic

"

TA, EC

IHPA

NR

Engineering Technicians

Institute for Cert. of Eng. Tech.

EC

IH

CR

Engineering Technologist

"

EC

IH

CR

Histologic Technician

Board of Registry - Am. Soc. of
Clinical Pathologists

EC

IH

NR + CR

Med. Assistant

AM. Assn. of Med. Personnel

EC

IH

CR

Med. Lab Technician

"

EC

IH

CR

Med. Records Tech.

Am. Medical Records Assn.

TA

IHPA

CR

Med. Records Adm.

"

TA

IHPA

CR

Med. Secretary

Am. Assn. of Med. Personnel

EC

IH

CR

Med. Technologist

Nat'l Certifying Agency for Med.
Lab. Personnel

EC

IHPA

CR

Med. Technologist

Board of Registry - Am. Soc. of
Clinical Pathologists

EC

IH

NR

Microbiologist

Am. Society for Microbiology

--

IH

NR

Nurse Anesthetist

Council on Certification of Nurse
Anesthetists

EC

IH

CR

Nursing Home Adm.

Am. College of Nursing Home Adminis-
trators

EC

IHPA

--

Nursing:

Child/Adolescent

Am. Nursing Assn.

EC

IHPA

NR

Pediatric Nurse Practitioner

"

"

"

"

Medical/Surgical

"

"

"

"

Med./ Surg. Clin. Spec.

"

"

"

"

See Key at end of Table

Psy. & Mental Health	Am. Nursing Assn.	EC	IHPA	NR
Psychiatric & Mental Health Clinical Specialist	"	"	"	"
Adult & Family Nurse Practitioner	"	"	"	"
School Nurse Practitioner	"	"	"	"
Gerontological Nurse	"	"	"	"
Nursing Adm.	"	"	"	"
Occupational Therapist	American O.T. Assn.	TA, EC	IHPA	CR
Optician	Optician Assn. of America	TA, EC	OC	NR
Ophthalmologist	Am. Board of Ophthalmology	EC	IH	--
Oral and Maxillofacial Surgeon	Am. Board of Oral and Maxillofacial Surgery	TA	IH	NR
Orthodontist	Am. Board of Orthodontics	EC	IH	CR
Pedodontist	Am. Board of Pedodontics	EC	IH	NR
Periodontologist	Am. Board of Periodontology	EC	IH	--
Pharmacist	Nat'l Assn. of Boards of Pharmacy	TA, EC	IHPA	NR + CR
Physicians Assistant	Nat'l Comm. on Cert. of Physicians Assts.	EC	IHPA	NR
Podiatric Assistant	Am. Soc. of Podiatric Assts.	EC	IH	CR
Practical Nurse	Nat'l Assn. for Practical Nurse Education and Service	EC	IHPA	CR
Psychological Hypnotist	Am. Board of Psy. Hypnosis	EC	IH	CR
Radiologic Technician	Am. Registry of Radiologic Technicians	TA	IHPA	CR
Radiation Therapy Tech.	"	EC	IHPA	NR
Nuclear Med. Tech.	"	EC	IHPA	NR

See Key at end of Table

Occupation	Organization or Certifying Agency	Competence	Who Designs	Norm/Criterion Referencing
Spec. in Chemistry	Board of Registry - Am. Soc. of Clinical Pathologists	EC	IH	NR + CR
Spec. in Hematology	"	"	"	"
Spec. in Immunology	"	"	"	"
Spec. in Neurobiology	"	"	"	"
Surgical Trade	Am. Surgical Trade Foundation	EC	IH	--
Technologist in Chemistry	Board of Registry - Am. Soc. of Clinical Pathologists	EC	IH	NR + CR
Technologist in Hematology	"	"	"	"
Technologist in Immunology	"	"	"	"
Technologist in Microbiology	"	"	"	"
Technologist in Nuclear Med.	"	"	"	"
T.V. & Radio Svc.	Nat'l Alliance for T.V. & Electronic Services	EC	IH	CR
Travel Agent	Institute for Certified Travel Agents	EC	IH	CR

KEY:

- TA - Task analysis based on on-the-job observation
- EC - Expert consensus
- IH - In-house
- IHPA - In-house with professional assistance
- OC - Outside consultant
- CR - Criterion referenced
- NR - Norm referenced

Job Analysis

Formal job analysis techniques require complex procedures, which might include surveys of job tasks by means of questionnaires (McCormick, Jeanneret, & Mecham, 1972), analyses of critical incidents recorded in workers' diaries (Flanagan, 1954), listing of job elements that include interest and attitudes about the job (Primoff, 1971) and interviews that uncover personality characteristics of superior performers that can be operationally defined and validated (Klemp, 1977). Dunnette (1976) summarizes different approaches to analyzing behavior according to four classifications: (1) the behavior description approach; (2) the behavior requirements approach; (3) the ability requirements approach; and (4) the task characteristics approach (suggested by Altman, 1966, and McGrath & Altman, 1966).

The behavior description approach focuses upon observations and descriptions of behavior that is actually engaged in while performing a task. Emphasis is placed on what is done as opposed to what should be done, or what could be done, or what must be done. The behavior requirements approach places primary emphasis on behavior that should be emitted or which is thought to be required in order to achieve a certain level of performance. Here one classifies behavior in terms of what must be done for successful performance as opposed to what is done.

The ability requirements approach suggests a classification system in terms of the attitudes, skills, or other attributes required by a task or set of tasks. The approach is similar to the behavior requirements approach but focuses on human attributes required by the task rather than the actual behavior required by the tasks... Finally, the task characteristics approach views the task as a set of conditions which elicit performance. These conditions are imposed upon the operator and have an

existence quite apart from the activities that they trigger, the processes they call into play, or the abilities they may require of an operator. Their view is that tasks can be described and differentiated according to the intrinsic objective properties which they possess. (Emphasis in the original, Dunnette, 1976, p. 488).

Whatever the method used, the objective is to end with a match between the requirements of the job and personal characteristics so that the credentialing mechanism developed is related to both. Techniques for making the linkage between job and personal characteristics, which take into consideration the complex interactions between persons and tasks, have been developed by psychologists. For example, the "synthetic validity" approach described by Dunnette (1976) uses several measures of ability logically related to specific components of a job. Scores on these multiple measures of ability are combined and have a strong statistical relationship with adequate performance of the entire job.

These techniques have not been widely used in the development of credentialing systems. Rather, in many credentialing systems, both the delineation of tasks and the identification of knowledge and skills presumably related to these tasks are accomplished by reasoned opinions rather than by rigorous technical procedures. Based on an assumption that experts from a profession's field of practice or related academic program are best qualified to determine competence in a particular field, every certifying agency contacted reported that expert group consensus was used to determine both the occupational tasks and the content of certification examinations relevant to

those tasks (see Table 2). Only 11 of the groups surveyed were guided in their definitions of competence by task analyses based on observations of workers. One reason so few on-the-job analyses are performed is that they are expensive. It was not uncommon for rigorous job analyses to cost many thousands of dollars (hundreds of thousands in some cases) because of the extensive data that must be collected across an entire professional field. Virtually every occupation that reported having performed such an analysis was subsidized by a foundation or government grant.

Radiology technicians have performed one of the most thorough job analyses done in the professions (Gilpatrick & Gullion, 1977). Their work resulted in thousands of carefully documented specific tasks, each linked to educational requirements and the knowledge necessary for performance. Both the task analysis and determination of the knowledge base were compared with the work of practitioners through on-the-job observations. The cost of this analysis was well over \$1 million, according to the Department of Labor. Attempts are underway to test the feasibility of expanding this analysis beyond the initial work site, the New York City Municipal Hospitals, and beyond the radiology technician occupation (Health and Education Resources, Inc., 1979).

In contrast to the extensive job analysis just described, the job analysis done by cosmetologists consisted of the consensus of a group of academicians who determined the knowledge

content of the profession on the basis of textbooks and curriculum. Similarly, the funeral home directors developed their knowledge base by having practitioners, professors, and students rate skills and techniques required on the job. Teachers developed the test items using this data as a curriculum guide. The dental assistants surveyed practitioners for lists of tasks performed--a cost-saving technique of job analysis. Such lists are then rated by practitioners and academicians for the frequency of occurrence. This limited analysis fails to weigh infrequent, but critical tasks as heavily as mundane, but routine ones, and merely describes the job as it is (behavioral descriptions) rather than as it should be (behavioral requirements).

The Use of Expert Opinion

Because of the reliance on expert opinion in defining jobs and determining the personal characteristics required, the knowledge, experiences, and motives of the experts designing the credentialing systems become critical variables in the design process. Typically, the designers of the certification mechanism include officials of the professional association and its affiliated certifying agency, active practitioners from the field, and academicians from the professional schools that train practitioners.

As Table 3 attests, about half the organizations in our review report that test items were developed in-house, about

TABLE 3
Examination Design and Construction

	OCCUPATIONS		ORGANIZATIONS		
	#	%	#	%	
On-the-job Task Analysis	11/37	30	9/38	24	DESIGN
Expert Consensus (Practitioners and Educators)	68/68	100	39/39	100	
In-house	36**/68	53	21/39	54	CONSTRUCTION
In-house with professional assistance	27**/68	40	14/39	36	
Outside consultant	7**/68	12	4/39	10	

** Figures exceed the total number of occupations in the sample caused by double-counting, due to the fact that examination construction procedures for certain occupations are conducted by more than one certifying organization.

a third generated test items with outside assistance from psychometricians and educators, and only four organizations relied primarily on outside consultants. Little relationship was apparent between either the type of occupation or the size of the credentialing organization and the test construction method used.

While consumers typically are not involved in this design process, or have no more than a very limited role, there is growing consumer involvement in general matters of certification and occupational regulation. Professions that select consumers knowledgeable about the profession's services are more likely to find them helpful. One professional association found that consumers who either had relevant education or were professional educators were especially effective as members of a design team. Where consumers lack technical knowledge, they often have objectivity and skills that may be lacking among members of the profession. For example, our survey found one state licensing agency that makes liberal use of retired people who have the time, energy, and commitment to participate.

Members of a profession may have different views about the rationales or functions of certification: in turn these differences can affect the nature and the quality of the certification system. For example, some design committees are comprised of the board of directors of the professional organizations whose multiple concerns may result in biases that are

dysfunctional to developing competence-based certification. If the organization's primary purpose is to promote the profession and its members, the certification process developed might emphasize labor supply control. Competence might be defined according to standards that are higher than they need to be, justified on grounds of up-grading the quality of worker performance and service delivery. Disparate values may not be adequately integrated so that consumers and professionals are served with equal consideration.

Besides different perspectives on the purpose of certification, experts differ in their views about how competence should be defined. For example, academicians might focus on theoretical aspects of the job, whereas practitioners might focus on the more practical aspects. Thus, they can differ widely in their views about the type of worker skills required for competent performance. A recent case study of how social service workers define competence found that administrators rated relationship-building competencies significantly lower than did practitioners (Huff, 1979). The study demonstrated that for this parameter of competence, different sets of experts were significantly and predictably at variance.

The domain of behaviors important to competent professional practice is complex, dynamic, and individualistic (Loveland, 1976). Changes result from scientific and technical developments or the changing needs of society. Because occupational roles vary so widely within and across work settings, agreement

among individual experts about the overall occupational scope of practice may be difficult to achieve. In pharmacy, for instance, roles vary significantly by setting: a drug store pharmacist functions quite differently than a clinical hospital pharmacist who assists physicians by preparing prescriptions for specific patients. Nevertheless, some common core of knowledge, skills, and abilities that has general applicability to the occupation as a whole must be determined. This is seldom easy, not only because knowledge is shared widely among professions, but because the lack of job analysis makes the quantity of "book learning" necessary to perform certain practices a matter open to dispute.

When professions identify the body of knowledge necessary to practice the profession, they are making important decisions about the prospects of that profession's collaboration and competition with other groups. Various professional groups must interact to meet the needs of consumers in the appropriate sequence and without overlap or conflict. A national system of professional certification would enable the professions to collaborate and share rather than compete and duplicate, although care should be taken that in setting uniform standards, innovation and experimentation in the professions are not stifled. There is, however, some evidence that professional associations will resist addressing credentialing issues from a broader perspective than that of the individual profession (Cohen, 1979). In occupations where competition is acute, as for example

between physicians' assistants and nurse practitioners, similar scopes of practice may be defined differently for the sake of differentiation. Too narrow a definition can prevent a profession from meeting unforeseen technologic developments or increased consumer demands for services.

In short, subjective values and considerations are intimately involved in expert consensus about the knowledge base of a profession. Lack of formal job analyses puts a heavy responsibility for design of a credentialing procedure on a small number of individuals whose personal motives, aggregate knowledge and experience may be neither representative of an entire occupation nor fully accurate about requirements for competent performance.

Issues in Assessing the Characteristics Needed for Competent Job Performance

The ideal way to determine if people are competent is to measure the outcomes of their performance. In the professions, especially those providing human services, outcome measurement is both expensive and complicated. It is very difficult to determine accurately what portion of the outcome is attributable to the worker and what portion to extraneous factors. To illustrate, a highly competent medical specialist who treated mostly high-risk cases would lose a large percentage of patients; using the rate of patient deaths as the outcome measure would not necessarily be an accurate indicator of

competence in such an instance. To control for extraneous variables, competence is often assessed through monitoring a person's performance of processes that under ideal conditions (those where extraneous variables are minimized) are known to lead to positive outcomes. Thus, teachers might be evaluated according to their performances in a controlled classroom setting or physicians might be evaluated according to performance in a simulation exercise.

Although process assessment may be more feasible than outcome assessment in some cases, it is still costly and complex. Therefore, assessment usually is removed another step from actual conditions to the assessment of characteristics believed to be important input variables: knowledge, behavior patterns, or other characteristics. Assessing input variables loses important information about how knowledge and behaviors would be applied in the process of doing a job. Empirical verification of the relationship between input variables and the ability to integrate and apply them properly tends to be weak.

In actual practice, only one input variable, knowledge, is routinely assessed. By limiting competence assessment to measurement of knowledge, most professions exclude the behavioral and affective domains of competence. Moreover, the amount of knowledge of a content area may be unrelated to superior job performance or even marginally acceptable performance:

Certainly many occupations require a minimal level of knowledge on the part of the individual for the satisfactory discharge of work-related duties, but even more

occupations require only that the individual be willing and able to learn new things. Since most of the specific knowledge acquired in the classroom is forgotten in a year or two anyway, there must be something about the learning process itself that accounts for the differences between the effective and ineffective performance. In fact, it is neither the acquisition of knowledge nor the use of knowledge that distinguishes the outstanding performer, but rather the cognitive skills that are developed and exercised in the process of acquiring and using knowledge. (Klemp, 1977, p. 103).

Thus, the knowledge requirements, as they are typically assessed, may not be as necessary for competent performance as assessors assume. A number of issues arising from efforts to measure characteristics needed for competent job performance are discussed in the following pages.

Irrelevant Eligibility Requirements

An important issue raised by current practices for assessing eligibility is that of requirements that are completely unrelated to competence. For example, in speech pathology and audiology, certification is available only to dues paying members of the professional association (This policy is slated to change in 1980.) Credentialing requirements that have little or no apparent relationship to effective job performance--age, citizenship, residency, payment of high occupational entrance fees, showing of proof of financial assets--introduce extraneous factors into the determination of minimum competence.

Minimum age requirements for entry-level occupations potentially affect a large number of applicants, and their relevancy

to public protection should be demonstrated (Haberfeld, Saxby, & Schletter, 1978). Dental hygiene educators justify requirements for minimum age and good moral character on the grounds that relatively young female hygienists may be subjected to advances by patients and may not possess the maturity to handle the situation professionally (Shimberg, Esser, & Kruger, 1973). Requirements for bonding or showing proof of financial assets, frequently imposed in the skilled trades, are another arbitrary barrier to entry. High blanket-bond requirements may be excessive for those practitioners who do relatively small jobs (Haberfeld, Saxby, & Schletter, 1978).

Educational Prerequisites

Another major issue raised by current credentialing practices concerns educational prerequisites. About 90 percent of the occupations and organizations sampled in our survey have some kind of formal educational requirement for credentialing. Entry level or paraprofessional occupations, such as technicians or assistants, typically require the least formal education. At the technologist and specialist level, a Masters or similar intermediate degree is frequently specified. Most organizations that regulate practice in advanced or specialized areas require training at the doctoral level. Insistence upon degrees conferred by universities may lead to excessively rigorous standards of minimal competence (although it enhances the prestige of the profession). Only a dozen occupations

surveyed specify education as the single prerequisite for certification: Most professions require education and experience gained either on the job or in an internship or practicum. Lengths of required work experience range from several months for emergency medical technicians and child development associates to seven years for clinical hypnotists. Lengths of internship or practicum programs, required by 17 of the occupations surveyed, ranged in duration from a hundred hours for emergency medical technicians (paramedics) to two years for orthodontists. Some certifying agencies are quite flexible in permitting applicants to substitute work experience for education and other training requirements. For example, a medical technician may be certified with a high school diploma and three years' work experience or, alternatively, an Associate's degree and one year's practical experience. Several certifying agencies, including the American Society of Clinical Pathologists' Board of Registry, the American Medical Record Association, and the American Nurses' Association, recognize certification in related occupations. An applicant certified at an entry or intermediate job level in the related occupation may use this credential for partial satisfaction of requirements in a new area. For example, a board-certified medical technologist is required to complete only one year of laboratory experience before becoming eligible for certification as a hematology technologist, instead of the two years normally required. The American Dental Assistant's Association

permits applicants to substitute acceptable work experience or internships for education requirements,* and the National Institute for Automotive Excellence, which requires three- to four-year apprenticeships for its certification programs, allows the substitution of work experience for either the apprenticeship or education.

A flexible approach to the determination of minimal competence is to limit sharply the amount of specific required knowledge or achievement. Art therapy has developed a point system whereby even academic credentials are not required, although they provide a large number of points toward certification. When a certain number of points is obtained in various types of settings or through different kinds of demonstrations of knowledge or skills, the individual is certified.

When a young profession develops formal educational programs after many workers have been trained on the job, the introduction of a certification system that requires formal education creates some confusion about what the certificate represents, because existing workers are usually grand-fathered into the profession (i.e., granted certification on the basis of already being a practicing professional). Many years may elapse before certification denotes a uniform standard of competence in such professions.

*The Association ceased to enforce education requirements for certification under pressure from the American Dental Association, which feared the loss of existing on-the-job trained paraprofessionals.

Constructing Tests to Measure Competence

The determination of what constitutes competence is "the rock on which all defensible examination procedures must be built" (Loveland, 1976, p. 5). However, current testing methodologies have been found to have serious shortcomings when it comes to verifying who is or is not a competent professional. Shimbert, Esser and Kruger (1973), in their study of occupational licensing practices, found that the quality of testing in many programs was quite low, failing for the most part to make use of testing technology advances made since World War II. These failures were attributed in large part to licensing boards' lack of expertise in test development and a lack of mandate to seek or use the expertise of outsiders. With respect to written tests, these authors found that "few licensing boards seemed to be aware of the necessity for planning a test carefully in order to insure balanced, comprehensive coverage of the field to be tested" (p. 194). When outlines were used, however, they usually were not sufficiently specific about content or emphasis.

Numerous difficulties were found with respect to specific types of tests. Overreliance on essay questions led to ambiguity, was time consuming, prohibited comprehensive coverage of content, and was unreliable in grading mostly because few attempts were made to achieve inter-rater reliability. The quality of multiple-choice test items was found to be low because questions tended to be drawn from textbook material,

were ambiguous, suggestive of the correct answer, or had more than one right answer. (Item analyses often were not performed, which would have enabled both weeding out of defective questions and constructing comparable alternative test forms.) Test reliability was frequently not assessed. Several major types of shortcomings were found in performance tests, such as the failure to determine crucial skills adequately (some boards selected very difficult, even esoteric tasks, rather than more relevant ones), or the use of administration procedures that were not standardized. The most serious problems with the criteria for evaluating performance were that raters were not provided clear and specific directions about what to look for, what constituted acceptable performance, or how to assign (or deduct) points; and often only one rater was used (Shimberg, Esser, & Kruger, 1973).

Proficiency examinations are intended to assess knowledge of job-related abilities rather than academic achievement (which is assessed with equivalency tests). Proficiency exams are especially appropriate for workers who have acquired job knowledge by nontraditional means. The federal government has funded projects to develop proficiency exams for four groups of allied health workers (radiology technicians, dental assistants, medical technologists, and respiratory therapists), in order to enable those not meeting traditional academic and training criteria to qualify for reimbursement for their services from Medicare. However, even these exams assess only

the knowledge components of performance rather than the actual ability to perform. This deficiency led the American Society of Medical Technologists, the nation's largest association of medical laboratory workers, to propose an amendment to the Public Health Services Act that stated that proficiency exams should reflect the nature of the work performed. There are serious questions among medical technologists about whether this proficiency requirement can, or should, be met with standard paper and pencil, multiple-choice exams.

From a survey of a wide variety of occupations and professions, Hiscox and Nafziger (1975) discovered that of over 2,000 occupations which have licensing or certification procedures, only a small fraction require examinations of any kind. Few rigorously constructed tests were found with a strong correlation to a proved set of essential abilities, and most tests appeared to have been established from the opinions of members of the occupation regarding how much a person should know about certain topics. In all the test descriptions examined, no mention of validity or reliability checks was found; test administration procedures were often not standardized; and testing in most occupations was norm-referenced, comparing candidates' scores with one another rather than with criteria related to performance.

This state of affairs may be slowly improving, especially as consumer and government pressures lead licensing boards to

utilize testing experts in the development of licensing exams.* Currently, however, most occupation groups do not adhere to accepted technical standards for assessing even limited intellectual competence.

Multiple-Choice Testing and its Limitations

In about 90 percent of the occupations and organizations sampled in our survey, the most frequently employed technique for testing competence was the limited written response test, usually of the multiple-choice type. When this type of test is properly developed, test items are written by experts (practitioners and/or academicians) and reviewed and edited for clarity. The items are usually rated according to criteria such as their importance to the occupation, frequency of occurrence of the activities, tasks to which they relate, or whether entering professionals should be able to answer the items. Systematic judging of whether items constitute a representative sample of job requirements for entry level competence is called content validation, and these judgments by experts focusing on knowledge requirements constitute the sole validation for nearly all certification tests. Analyses

*Certifying agencies have limited control and influence over the use of the examinations designed. In pharmacy, for example, a national certification mechanism exists, but pharmacy licensing bodies in most states do not use it and instead write their own, often, as in most professions, without expert consultation.

sometimes are performed to eliminate items that are either too easy or too difficult before a final version of the test is constructed, although frequently the field test data required to perform this task are not gathered until the first administration of the exam to applicants. New tests use between 10 and 50 percent of items from the original tests as "equating items," and new groups' performances on these equating items determine the ways in which cutoff scores for new tests, with new items, should be adjusted.

The preceding depiction is oversimplified, but it represents the essential processes in multiple-choice test development. These fundamental technical activities influence the quality of the final product and the meaning of test results. The larger the credentialing program, the greater the reliance on content validated multiple-choice examinations due to their greater ease of design and administration.

Regardless of whether or not acceptable testing standards are followed, multiple-choice and other limited response tests measure few aspects of overall competence. An important aspect of competence measured through the use of most tests is knowledge. But even when the knowledge base for testing is carefully delineated, as few as 100 representative sample items may make up the certification examination. For example, cosmetologists use 100 item tests; speech pathology and audiology and emergency medical technicians use as few as 150 questions. A very narrow definition of competence emerges from sole

reliance on tests, especially when test content reflects administrative concerns about length more than actual volume of job content.

Other Types of Examinations

Numerous alternatives have been tried to overcome the limitations of multiple-choice tests. Most alternatives also pose some problems in administration or validation, whether they involve performance assessment, simulations, essay and oral examinations, or assessments of personality traits.

In the area of performance assessment, the Child Development Associates (CDA) use local assessment teams including a sponsor selected by the candidate and acceptable to CDA (in terms of experience and training) along with the children's parents. These teams observe candidates' performance in day care settings and evaluate portfolios of candidate experiences. Eventually, a national office representative of CDA participates in the evaluation session in order to maintain continuity of procedures for all candidates according to their published observation guidelines. Although inter-rater reliabilities are not established, and validation studies have not been performed, 14 states require this certification for employment as a day-care worker.

Only 19 states currently have certification mechanisms in use for drug and alcohol abuse counselors (Camp, 1979), but

nearly all models include performance assessments according to supervisor ratings, completion of training courses, written tests, and demonstration of skills. Skills measured include counseling skills, treatment planning, referral skills, crisis intervention, and communication skills. Skills may be demonstrated by writing a treatment plan in a simulation exercise. (Minnesota counselors videotape an actual or roleplayed counseling session.) Portfolios and oral interviews are used as secondary evidence of applicants' skills.

In our survey, only 13 of 69 occupations employing testing mechanisms indicated the use of practical examinations designed to simulate actual job performance conditions. Only two organizations, the National Commission on Certification of Physician's Assistants and the American College of Nursing Home Administrators, reported the use of clinical simulation exercises. Another type of simulation examination, a refinement of traditional multiple-choice tests, is the programmed testing procedure used in Part III of the National Board of Medical Examiners Assessment of Clinical Competence. This exercise "simulates" performance by using objectively scored paper-and-pencil tests. Applicants are confronted with realistic situations about patient management problems and are required to proceed through a series of decisions, each accompanied by an increment of information upon which the next decision depends. The National Board uses a linear model that allows for only one correct option at each decision point. A

branching model, used in medical specialty certification, allows for more than one route to a solution (McGuire & Babbott, 1967).

Part III of the medical examination purportedly tests clinical competence. Yet, there is little evidence to show the relationship between Part III and job performance. A study of 102 medical researchers found that measures of factual medical knowledge were better predictors of Part III performance than were job performance oriented measures (MacKowiak & Goniella, 1973). The authors of this study and other experts suspect that part III of the National Board exam differs from the first two parts primarily in the ingenuity in test taking skills required (see, for example, Cronbach, 1970, and Hecht, 1979).

The National Association of Housing and Redevelopment Officials has broken new ground in certification by requiring simulation of management behavior with the use of an in-basket exercise. Numerous types of administrative and managerial problems, 25 of them in all, are given to applicants.* A committee hand-scores responses for appropriateness, for their

*Applicants are given a stack of messages that includes simulated memos from a boss, notes from a secretary and maintenance staff, hand-scrawled complaints from tenants, questions and requests from outside agencies, forms and reports--each representing a problem awaiting immediate action. Skills evaluated relate to planning and organizing work, supervising and controlling work of staff, supervising and maintaining residents' services, assuming organizational responsibility, problem analysis, human relations sensitivity and skills, and quality of judgment.

demonstration of a variety of managerial skills, and then makes a general comment on performance. This test was based on a job analysis that identified important aspects of the job's content.

Regarding essay examinations, our survey found only two professions, travel agents and gnathologic orthopedists, that rely exclusively on this type of test; few other occupations include any essay questions in their assessments. Such examinations are relatively costly to administer to more than a handful of applicants, because scoring may be quite time consuming. Perhaps for this reason the professions using essay questions are relatively specialized and involve few candidates. The exception seems to be accountants seeking certification from the American Institute of Certified Public Accountants. Essay examinations range in sophistication from the type developed for travel agents, where a single individual wrote the test and the guidelines for its grading, to the examination for Certified Public Accountants, whose essays are graded according to an analytic system that can establish inter-rater reliability. In the former case, scoring follows relatively loose guidelines and model answers, much like an academic grading system except that points are assigned for correct responses. In the CPA examination, the analytic system of grading is based on the presence of key concepts.

The difficulties with essay examinations also arise with oral tests, which ten of the occupations surveyed for

this paper use as a component of their testing program. In California, the oral examinations used for professional certification in acupuncture, podiatry, and psychology have been criticized as being among the hardest types of tests to construct, administer, score, and validate (California Department of Consumer Affairs, 1979). Among the potential sources of bias cited were: inconsistency in stating questions; wide variations in responses; lack of respondent fluency, rather than lack of knowledge; physical characteristics of respondents; and even time of day. In regard to this last variable, the Board noted that a state civil service oral examination had been discarded when the rank order on the list of results was found to parallel closely the alphabetical order of the names; "candidates were examined in alphabetical order and those tested later in the day fared less well than those seen in the early hours." (California Department of Consumer Affairs, 1979, p. 5.)

The use of tests for affective qualities of personality, such as empathy or attitudes about others, has proved problematic. Personality tests tend to be theory-bound and more useful for diagnostic purposes than for prediction of job performance or assessment for certification. A major weakness of personality tests is the "test-trait fallacy" (Tryon, 1979). To paraphrase Tryon, this fallacy is based on two assumptions: (1) that test scores are trait measures and (2) that test scores are basic properties of a person. Logic holds from

these assumptions that test scores reflect basic properties of a person. This logic converts a dependent variable (test scores) into an independent variable, treating it as a causal force. This can only be avoided by specifying the necessary and sufficient conditions for resulting test scores. Without these specifications, the temptation is to define the results in terms of the results themselves. While personality or trait measures may have descriptive meaning, they may not be inferentially (or predictively) valid.

The test-trait fallacy can be avoided by dividing tasks into component skills and developing standardized tests of those skills to predict job performance (Tryon, 1979). This suggestion is appropriate for jobs requiring psychomotor skills, but it increasingly loses relevance for jobs requiring more complex cognitive and affective aspects of competence. Integrative or synthesizing skills are lost in testing isolated subskills. A better way to identify the presence of these hard-to-measure aspects of competence is to demonstrate consistency of responses across multiple stimulus conditions, though every stimulus situation found on the job cannot be accounted for. Menges (1975) reflects the view of most experts that personality measures used to predict performance offer little help in identifying readiness for professional practice. He concludes that "because of the generally discouraging results of past efforts in personality assessment, the successful identification of readiness is more likely to be accomplished through other strategies" (p. 182).

Validation

The simplest method for attempting to show validity of an examination is to establish face validity, which requires only that the test appear to measure what it purports to. There is no assurance that significant aspects of skills are actually assessed. Content validity differs from face validity in requiring that experts judge the content of the test items to assure that they include a representative sample of significant aspects of knowledge or skills. Content validation procedures are the most frequently used means of validating certification tests; experts rate the relevance of test items according to definitions of relevant performance areas. These are "so carefully detailed that rules of item writing will assure appropriate representation of all facets of the definition" (American Psychological Association, et al., p. 28). Content validity is established more systematically than face validity, and though still rational instead of empirical, it is substantiated by the thoroughness of the procedure followed. Because content validity has a process orientation what is done rather than an outcome orientation (how well is it done), it is less meaningful for competence identification than criterion-related validities derived from predictive or concurrent studies.

Predictive validity indicates the extent to which an individual's future performance can be predicted from test performance; concurrent validity reflects the extent to which

current performance of incumbents can be predicted from test scores. The concurrent or predictive validity of a content valid test can be determined by relating test performance to some job performance criterion. These procedures would indicate the extent to which a certification examination, for example, predicts who is performing or will perform at an acceptable level upon entering professional practice. Such information illuminates the relationship between the test and actual performance.

A major technical reason for the lack of predictive validation in certification testing is that defining a performance criterion against which to validate a test is very difficult, albeit crucial to demonstrating the quality of the test. In the service sector, the performance outcome is determined largely by variables not under the control of the individual being assessed. Moreover, criterion measures must reflect the purpose of the test. For example, if the purpose is to predict minimal acceptable performance so as to protect the public, some concept and definition of public protection must guide the selection of criterion measures. Many criteria that could be selected would have little to do with universal skills necessary for entry level workers to perform competently, which is the stated goal of every certification exercise. No examples of criterion validity were found researching this chapter.

Content, construct and criterion related (predictive and concurrent) studies are considered legally adequate if properly

executed. But to enhance the public protection function of certification, test scores' relationship to actual performance must be known:

. . . other forms of validity are not substitutes for criterion-related validity. In choosing a test to select people for a job, for example, an abundance of evidence of the construct validity of a test of flexibility in divergent thinking, or of the content validity of a test of elementary calculus, is of no predictive value without reason to believe that flexibility of thinking or knowledge of calculus aids performance on that job. The model of predictive validity should guide thinking about validity in such applications even where circumstances preclude an actual criterion related validation study. Whatever other validity information a manual may include, one or more studies of criterion related validity must be included for any test developed for prediction and for many tests intended for diagnosis; otherwise, such tests can only be regarded as experimental (American Psychological Association, et al., p. 27).

Menges (1975) reviewed examination procedures of the type reflected in this report's survey, including those for teaching, law, engineering, and medicine. He found that these exams have adequate face validity and content validity. Some also present limited evidence of concurrent and construct validity, but none present adequate evidence of predictive validity. For example, in teaching he found correlations with the National Teacher Examination and ratings by principals and supervisors during the first year ranging from -.15 to .45 (median .11) and after three years an average of .10. He concluded "...until better research appears, showing stronger relationships with practice, it is difficult to identify practical utility for the National Teachers Examination" (Menges, p. 189). In medicine, Menges (1975)

found that the level of performance on the Patient Management Problems Test did not discriminate among poor, average, and excellent clinical performance.

Many studies have shown that course grades are not efficient predictors of job performance. For example, in 27 studies investigating the relationship between professional school grades and career performance in medicine and other professions, little or no relationship was found (Wingard & Williamson 1973, cited in Menges, 1975). Furthermore, written tests correlate with reading tests and academic grades but they lack significant relationship with performance measures (Price, 1964; Livingston, 1971). Even though frequent attempts are made to determine the adequacy of certification examinations through comparing their scores with grades earned during training, because test scores are correlated with data prior to rather than subsequent to assessment, such procedures fail the test of relevance (Menges, 1975).

This lack of correlational evidence suggests that credential granting bodies have overlooked the great importance of validating certification and licensing tests against performance criteria. This point was made over 25 years ago:

From the standpoint of validity one of the most serious errors committed in the field of human measurement has been that which assumes the high correlation of facts and principles on the one hand and performance on the other. Nevertheless, examinations for admission to the bar, to medical practice, for teaching. . . are predominantly verbal tests of fact and principle in their respective fields. Relatively little attention has been paid to the testing of performance as such (Ryan & Fredericksen, 1951, cited in Hecht, 1979).

However, little progress has been made since. To illustrate, speech pathologists and audiologists use the National Teachers Examination, which was validated by having 120 panel members, mostly academicians, analyze each test item for relevance to entry level competence and for whether an entry level person should be able to answer it. In effect, this analysis determined whether the panel members thought the subject matter was covered in approved university training programs. Thus, graduates of approved speech pathology and audiology programs do better on the certification examination than do graduates of unapproved programs. Attempts to validate curriculum-tied tests against students' academic performance are also circular. To no one's surprise, better students perform better on these examinations. Neither curriculum nor test, however, may be related to job competence.

Some predictive validation studies in certification are being contemplated. In contrast with the previous example, practitioners begin by voting the relevance of content according to task analysis for the dental assistants' and pharmacists' examinations. Dental assistants, whose professional organization has sophisticated in-house testing capabilities, plan to examine differences in experience, training, and work environment variables, comparing them with test scores and performance outcome ratings. This is an expensive and complex procedure, as a result of difficulties in identifying appropriate outcomes (criteria) and in the logistics for such

research. Those professions which have performed concurrent validation studies of paper and pencil multiple choice exams have usually obtained stronger statistical relationships between test scores and criteria when performance criteria are based on academic performance, rather than job performance. This is consistent with the preceding conclusion that the best students, not necessarily the most affective professionals, perform well on such tests.

Growing public and private concern over the lack of predictive validity in certification testing has led to greater involvement in this area by federal and state government. The federal government has been particularly involved with tests for medical technologists. One example of state concern is a claim by the Wisconsin Department of Regulation and Licensing and the Architects' Section of the Examining Board of Architects, Engineers, Designers, and Land Surveyors that the nationally developed credentialing examination for architects is not sufficiently job-related. To demonstrate their point, Wisconsin architects conducted two studies of the national examination. The first study found scant evidence that necessary architectural skills were accurately reflected in the national test. The second study found little positive correlation between test results and a variety of background experience relevant to job performance; in fact, the study found a negative correlation between test outcome and experience as an employee in offices of registered architects. With these

findings in hand, the Wisconsin group began developing its own licensing examination, with the help of outside consultants. Task analyses and validation studies are currently being completed and the examination may be administered for the first time in late 1979 (National Center for the Study of Professions, 1978).

In summary, most professions could vastly improve their licensure and certification examinations by making them more relevant to job competencies and validating them for evidence of their relevance. The majority of credentialing organizations know little about validation techniques, and most have the technical work of certification done by commercial testing companies which take little, if any, responsibility for the test. Unfortunately, "most exams are put into use before validity studies are started or with none in mind until problems identify themselves" (Hecht, 1979).

Levels of Credentials and Their Relationship to Competence

A recent analysis of the relationship of three levels of credentials to competence (in psychology, but applicable to any profession) helps illuminate the problem of validation (Koocher, 1979):

Primary credentials are those that are earned over time by direct contact with trained instructors. These credentials are based on longitudinal samples of the practitioner's behavior, with person-to-person supervision and direct observation by senior colleagues. Objective and subjective evaluations of the practitioner's progress are generally

made by multiple evaluators as training progresses through a stepwise sequence of learning. Examples of primary credentials would be service-oriented graduate training programs at accredited universities or carefully supervised practica, internships, or fellowship programs.

Secondary credentials use primary credentials as basic prerequisites but also incorporate other elements in the determination of qualifications. Such credentials include statutory licensing or certification as well as recognition by diploma by specialized certification boards. One must first complete the appropriate training and degree programs in order to be considered for a secondary-level credential. Except in the case of grandparent clauses, virtually every secondary-level credential requires a sample of the practitioner's behavior . . . which may include multiple-choice, essay, oral examinations or a combination of these. All secondary credentials, however, are differentiated from primary credentials by the fact that the sample of behavior is invariably brief and limited in the former but detailed and prolonged in the latter.

Tertiary credentials . . . what distinguishes this level of credentialing is the fact that no behavioral sample, first-person contact, or substantial individual scrutiny intrinsic to the credential itself is considered. Such credentials are instead based solely on evidence that primary and secondary credentials have been obtained. In a sense, tertiary credentials simply attest to the fact that the holder has primary and secondary credentials. . . . Such tertiary credentials include the National Registry of Health Service Providers in Psychology. (pp. 697-699)

Koocher examined each level of credential in light of the three types of validity discussed earlier: face validity, content validity, and criterion-related validity. All three levels were found to have superficial, or face validity. "In a sense all three sorts of credentials draw on their face validity for broad acceptance without much probing" (Koocher, p. 699).

Content validity is more problematic. Primary credentials could be presumed to have content validity, although not uniformly so. Curriculum variations and differences in practices

within an occupation create multiple, content valid primary credentials with qualitative differences. "It is the difficulty in differentiating among the validities of different competence constructs represented by the content and face aspects of primary credentials that has led to the development of secondary and tertiary credentials" (Koocher, p. 700).

The content validity of secondary credentials cannot be established on the basis of primary credentials, because these represent quite variable content; nor can content validity of the credential be firmly established on the basis of examination scores because certification exams are not standardized for all test takers, often contain content unrelated to the practice to be undertaken, or ignore aspects of competence (such as behavioral and affective aspects of competence) critical to actual performance.

Regarding tertiary credentials, Koocher states, "all these facts leave the status of tertiary credentials quite muddled as far as any indication of content validity for the measurement of competence, since they rely chiefly on primary and secondary credentials that are generated on the basis of highly variable data" (p. 700).

Criterion-related validity of primary credentials appears low unless, in rare cases, curriculum has been designed and observations directed to focus on areas of professional competence. With respect to secondary credentials, our own review and analyses discussed earlier, as well as analyses by

others (e.g., Hiscox & Nafziger, 1975) indicate that there are no published empirical data which demonstrate that existing

licensing or certification examinations correlate with successful job performance. With respect to tertiary credentials, Koocher states:

Again, we find the tertiary credential at the bottom of the heap, so to speak, when it comes to the matter of concurrent or predictive validity. These credentials are subject to all the contaminants of the primary and secondary credentials they rely on, with the possibility of a yet unmeasured interaction effect. Given all of the potential oversights, measurement errors, self-report biases, and other factors that may cause an individual's competence (or lack thereof) to be misrepresented, it is entirely possible that the competence a tertiary credential presumes to measure is totally nonexistent in any given individual case (p. 700).

Test Use

Cutoff Score Determination

There are two basic methods for setting cutoff scores: normative and absolute-standard approaches. With the normative approach, a specified proportion of applicants is expected to fail the exam; the absolute-standard approach specifies the number of items that must be answered correctly. Both approaches have shortcomings.

The normative approach has been criticized because (a) a predetermined percentage of candidates is expected to fail regardless of the competency level of the candidate sample, (b) comparing candidates' relative performance is not relevant to ascertaining whether or not a minimal competency level has been achieved, (c) candidates are said to be artificially spread out into a normal distribution--a

distribution which may not reflect the distribution of competence in the candidate population, and (d) the standard deviation units chosen for the passing point are often arbitrary and do not relate to actual competency status.

The absolute-standard approach has been criticized for (a) arbitrary selection of the absolute standard, and (b) insufficient attention to the variations in difficulty level of different forms of the same examination.

In addition to the criticisms leveled against each approach separately, both approaches can be criticized for (a) not making decisions, and (b) for not systematically utilizing collateral information regarding candidate competency status. (Schoon, Gullion, & Ferrara, 1979, p. 184).

Some of these criticisms may be overcome by explicit and simultaneous consideration of several variables that are critical in choosing a cutoff point.¹

The typical methods for establishing cutoff scores for certification exams are: asking professionals to estimate the number of questions they would expect a minimally competent individual to answer correctly; having them estimate the number of applicants out of a sample of 100 who would be minimally competent; having them judge the difficulty of individual test questions for minimally competent persons; or, asking them to construct a hypothetical group of persons, each of whom would have the minimum amount of knowledge to assure the public that only competent individuals are certified. Reliability coefficients, indicating how well the experts agree on such ratings, are frequently low, possibly because estimates of the number of individuals who would pass the examination are very difficult to make (Educational Testing Service, 1977). To improve reliability, test designers may use statistical

procedures to correct for guessing, or may divide panels in half and compare their judgments, etc. Nevertheless, choice of cutoff scores are generally subjective, even after many tests have been administered and empirical data regarding actual test performance are available. Since criterion performance data are seldom available, certification exam cutoffs are selected on a judgmental basis, not an empirical one.

Cutoff scores in use are often established in arbitrary, unexamined ways--through legislation, by custom, or by the practice of other professions, regardless of differences in the population being tested. The way cutoff scores were established in Florida's much publicized minimum competency test for high school students parallels the procedure used by many professions. In choosing an arbitrary cutoff score for passing at 70 percent, the state was attempting to establish political credibility for the test, despite acknowledged problems of subjectivity involved (Glass, 1978).

The teachings of psychometricians have little visibility in the service professions responsible for certifying candidates. Decisions about test design, use, and cutoff scores frequently are relinquished to testing agencies or consultants, who, lacking appropriate guidelines from the profession, may be governed in their decisions by favorite procedures, habit, budgetary constraints, or issues unrelated to public protection or other outcome criteria.

Improved methods for establishing cutoff scores offer a

substantial opportunity to enhance the social equity of certification processes. For example, one study has shown that the supply of unemployed workers was significantly correlated with the cutoff scores set on licensing exams in 10 occupations across three states over periods ranging from 11 to 59 years (Rayack, 1975). As the unemployed labor supply increased, the cutoff scores rose; as labor supply dwindled, they were lowered. In this case, people are denied because of cutoff scores that reflect labor supply rather than their abilities.

Frequently, many different cutoff scores are employed by the different states that administer examinations to candidates seeking entry into the same professions.

In one reputable profession, in which 48 state examining boards administer the same examination on the same date, 21 different passing points are employed. The passing points range from -2 standard deviations below the national mean to .5 standard deviations above that mean. Percentile scores are also used, as are a variety of raw score passing points. These various passing points are employed by the states to reach a common decision as to whether or not the candidates possess the minimum necessary competence for the successful practice of the profession. This example illustrates the inconsistencies and possible injustice which can arise when agencies lack appropriate guidelines to establish appropriate passing points. An appropriate passing point reflects the competency status of the candidate in relation to his ability to practice, instead of reflecting the myriad of independent and opaque decisions reached by the agencies on the basis of information of varying quality. (Schoon, Gullion, & Ferrara, 1979, p. 183)

All certification tests use a single cutoff score. The cutoff score used for certification may or may not reflect possible measurement error. For example, there may be an 80 percent chance that one's true score falls within a range of

five points above or below the obtained score. The higher the standard error of measurement, the greater the range of scores for any given probability. These ranges of scores are never used, however, for final pass/fail decisions about certification. They may be factored into the formula for determining single cutoff scores, but making final decisions based on a range of scores leaves too many decisions for certifiers to handle fairly or cost effectively.

Test Administration and Reporting

Making tests available to candidates is an important aspect of fairness in test utilization. Because exams must be administered in carefully controlled environments to protect the security of the tests, limited numbers of sites are used. For most candidates this is an accepted aspect of gaining entrance to a profession. Nonetheless, some candidates are more inconvenienced than others. Some have to travel long distances to gain access to the exams, and lost work time and costs of travel are an added expense of the exam. Test development, administration, scoring, and reporting can be time consuming and expensive, and the costs are passed on to the candidates. Special test administration procedures for handicapped individuals may be unavailable. When practical exams are used, the setting for administration may be more foreign to some candidates than to others, which can constitute an important extraneous or confounding variable in measuring

competence. In short, administrative procedures can contribute significantly to the validity and fairness of an exam.

Another important consideration in test utilization is the way information is provided to candidates. Most certifiers report pass-fail scores with no information about the areas in which a candidate shows weak performance. A notable exception is the Dental Assistants Examination, which has 23 content areas. The candidates are given information as to whether they scored in the bottom, middle, or upper third of the distribution of scores on each content area. Proponents of reform have urged that more information concerning testing procedures and examination scores be made available to people who take standardized tests. Many critics of testing, including consumers, teachers, parents, and civil rights groups, point to the significant impact of standardized tests on the education and career aspirations of students and applicants to professional schools. In addition, concern for the misuse of test scores by colleges and professional school admissions officers, the lack of public accountability of the testing companies, and their long standing policy of restricting test takers' access to their examination scores have led to recent state and federal legislative activity.

New York, the first state to enact legislation aimed at achieving openness in testing, requires that test questions and current answers be filed with the State Commissioner of Education within 30 days after standardized scores have been

released and that, upon request, a test taker be furnished with copies of the test questions, his or her own answer sheet, and a correct answer sheet. The law also requires public disclosure of any research done in conjunction with standardized tests and precautions taken to insure confidentiality. Opponents to such legislation allege that requirements directing disclosure of test items will breach security procedures, prevent the reutilization of questions on subsequent examinations, and contribute to significantly higher costs charged to test takers.

Assuring Continued Competence

Concern with continued competence assessment reflects the growing recognition that skillfulness in a given area must be reevaluated periodically. Rapid technological and scientific advances in the past two decades have hastened skill obsolescence and have led to the growing awareness that practitioners must keep pace.

Consumers are the group primarily intended to benefit from attempts to assure continued competence. Agencies engaged in defining, measuring, and evaluating continued practitioner competence substitute their informed judgment for that of consumers, who are probably ill equipped to identify essential professional attributes. Individual practitioners also benefit from continued competency requirements. Providing better services allows practitioners to command higher prices or fees.

In addition, individual performance deficiencies are identified and incentives are provided for practitioners to achieve and maintain acceptable levels of performance. Personal efforts to acquire up-to-date knowledge reassure practitioners that the services they provide conform to the current state of the art.

The most usual mechanism for demonstrating continued competence is participation in continuing education programs. Continuing education can be recommended or mandated by an employer, a government agency, or a private society or association. If mandatory, the practitioner must participate in an approved course of study for a stated period of time as a necessary but not sufficient condition for continued practice² or membership in a voluntary association. If the program is voluntary, the practitioners may obtain special achievement recognition in the form of a certificate or directory listing. In most cases the practitioner is required to pay a tuition fee for the course and must forego income that could have been derived during the time spent on the continuing education program. If continuing education is viewed as a particular instance of human capital investment, then the costs of education and the income foregone should be more than offset by future rewards (intrinsic and extrinsic) from the successful application of knowledge gained in the program. Costs to consumers also are increased by continuing education requirements. At any given time, there may be a decreased supply of services

due to practitioners' fulfilling continuing education requirements. In addition, it is likely that the costs associated with continuing education will ultimately be borne by consumers. These costs will not necessarily be viewed as objectionable if they are accompanied by a commensurate increase in service quality or efficiency.

Institutions of higher learning have enormous opportunities for involvement in continuing education programs, which promise continued viability and solvency in an era of declining enrollment in formal education programs. The ability to instruct and work closely with practitioners, many of whom have attained high levels of education, should be particularly appealing to educators. Close cooperation between educators and the appropriate regulatory body or association must be maintained in order to structure and prepare course content and monitor practitioner compliance with continuing education requirements.

Despite the increasing reliance by licensing and certifying bodies on continuing education, there is a surprising lack of evidence of its effectiveness. Even strong advocates realize that the many mandatory programs that only impose attendance requirements in no way assure continued competence. Inadequacies perceived in the continuing education model more than a decade ago have not often resulted in the institution of more innovative formats (Miller, 1967; Rockhill, 1978).

Traditional content oriented, passive methods of professional education have repeatedly failed to provide higher quality services. The need for change is evident. For example, a study conducted at the University of Illinois Center for the Study of Medical Education sought to determine the extent to which physicians responded to unexpectedly abnormal results in three routine admission laboratory tests. A review of patients' charts after discharge, during a one-month period, revealed that only 35 percent of the unexpected abnormalities produced any perceptible action on the part of the physician. An education committee attempted to correct the problem by the use of an instructional method involving a simple presentation and discussion of the data with expert physicians. More than 80 percent of the staff members took part in the meeting, and they agreed that prompt correction of this unacceptable professional performance level would be forthcoming. Repetition of the chart study one month later, however, produced identical results (Miller, 1967). The content specific, passive educational intervention had no positive effect on performance.

When professional organizations make continuing education mandatory they may actually increase resistance to learning (Rockhill, 1978). Resistance increases when programs are constructed around faculty interests, rather than focusing on problems confronting the practitioner (Miller, 1967 & Rockhill, 1978). Individuals may also resist participating in a program

where resources are devoted to meeting the general needs of the attending group at the expense of individual interests (Knox, 1974). Voluntary course enrollment, however, has lacked practitioner support. A 1956-1965 study of 2,050 physicians practicing in Kansas indicated that although 57 percent of all practitioners in the state participated in continuing education courses offered at the University of Kansas, only 6.5 percent of the participating physicians accounted for half of all hours of continuing education recorded (Lewis & Hassanein, 1970). Thus, voluntary continuing education may promote expertise only for a select handful. It seems that those responsible for designing voluntary courses must substantially restructure the content of their courses and their recruitment efforts to make these programs more attractive if they wish to reach as many practitioners as possible. Participants could help by identifying some of their own educational needs (Miller, 1967). One author suggests that "one must recognize a need to know before one will learn" (Miller, 1967).

The need for greater attention on the part of government and private association officials to evaluating the outcomes of current continuing education programs cannot be overemphasized. As the "lifetime learning" concept continues to gain wider acceptance and recognition in diverse fields, the creation of innovative approaches to education for practitioners will become a substantial challenge. Despite the protectionist, as opposed to innovative, spirit of many professional

organizations, they provide the conduit for future dissemination of innovations in educational programs to assure continued professional competence.

NOTES TO SECTION II

¹One such method uses a Bayesian statistical technique to combine information from the established minimum criterion level, the ratio of losses associated with false positive and false negative decision errors, true levels of functioning of the applicant sample, and the degree of certainty that an applicant's true level of functioning exceeds the minimum criterion level (Schoon, Gullion, & Ferrara, 1979).

²As a matter of administrative convenience, a noncomplying practitioner most likely will be suspended or otherwise temporarily enjoined from continued practice until compliance is demonstrated, rather than being completely barred from future practice.

III. THE HUMAN RESOURCE DEVELOPMENT SYSTEM: EDUCATION, CREDENTIALING, AND THE WORKFORCE

Through the efforts of individuals and groups, the physical work and critical judgments necessary to accomplish the tasks of society are carried out. An education-certification-work triumvirate functions to cultivate the skills necessary to accomplish the tasks of society and to maintain those skills in the face of technological advancement. There is, nonetheless, room for substantial improvement in the interrelationships among these three components of the human resource development system.

The Workforce and the Human Resource Development System

Any consideration of competence-based credentials must take into account the wider human resource development system in which the credentials are to be implemented. This system has three principal components:

1. The educational component initially and continually prepares young professionals to enter the profession and conducts research to advance the knowledge base for the profession.
2. The credentialing component regulates the quality, number, and kind of individuals that are allowed to practice the profession.

3. The workforce component organizes the professional expertise into work units to provide service to the community.

The production of human resources for the work force is implemented through an array of educational mechanisms and graduated on-the-job experiences under supervision. In our society, educational institutions, including primary and secondary schools, vocational schools, professional schools, and universities, teach students the cognitive skills and provide the orientation and socialization fundamental to their functioning in the world of work. Upon graduation, the degree is the credential that denotes the individual's "job-eligible" status. The workplace then builds on the fundamental school training to fit the individual's skills to the tasks of the organization or the wider community. The system of development can be pictured as a flow of human resources (raw materials) from an educational environment into the work environment. Each component--education, certification, and work--not only plays a unique role but has its own motives, political constituents needs, and perspectives on competence which may conflict with harmonious implementation of policies and practices.

Although the three components describe a logical flow for development, maintenance, and use of professional skills, realization of consistency among the three components requires a fourth component: a management component that coordinates

criteria and information plans for the future, and reconciles conflicts. (This is discussed in greater detail in a later section on implementation.) Manpower is a component of every kind of work, but it is often overlooked as a separate area for planning and management. There are no comprehensive professional manpower planning efforts on a national level, despite some efforts to plan for specific professional categories, such as physicians. Most such planning is oriented toward education.

Because of the explosion of knowledge and information in this century, the special expertise of professionals has become an increasingly important segment of the human resource development system. Professions have added a regulatory "faucet" in the flow of individuals from education to work by instituting a range of credentials (including certification, registration, and licensing) as initial quality control mechanisms. However, as previously discussed, the proximity of certification mechanisms to job competence varies with respect to how competence is defined, what aspects of competence are assessed, and how valid these assessments are with respect to actual job performance.

Educational Credentials and Job Competence

Education plays an essential role in the manpower production and utilization equation. Use of primary educational credentials in certification systems, however, is not based on

evidence that they are any more related to performance outcomes than are the requirements in secondary (certification) credentials. While primary credentials have the greatest face validity, researchers find their content validity is too variable to assure competence in any given setting or for any given individual (Koocher, 1979). Further, they find no predictive relationship between academic competence, measured by academic grades or degrees, and work performance. For example, Hogan (1976) cites the following several studies that question the relationship of academic achievement and success on the job.

- A Labor Department study by White and Francis (1976) of ten occupational groups in two labor markets found that in only 15 percent of cases, was there any correlation between years of education and job performance. Furthermore, the increase in educational attainment of the work force was only slightly due to the increase in the educational qualifications necessary for most jobs. The authors quote the comprehensive HEW Task Force Report, Work In America, which concluded that "for a large number of jobs, education and work performance appear to be inversely related" (p. 135).
- McClelland (1973) has reviewed and summarized extensive research indicating that while most test scores can predict academic grades and vice versa, neither show any consistent relationship to later life and work performance.
- Taylor, Smith and Ghiselin (1966) found that, even with the highly intellectual and technically complicated job of research scientist, on-the-job performance is not related to grades in college.
- Similarly, Livingston (1971) found in a review of empirical studies conducted at the Harvard Business School that academic achievement was not a valid predictor of management potential.

- A study by Thorndike and Hagen (1959) found no significant correlations between aptitude test scores and different measures of later occupational success.
- Holland and Richards (1965) found almost no correlation between measures of academic ability and real-life achievement outside of the classroom, including actual accomplishments in social leadership, the arts, science, music, and drama.
- Price and his colleagues (1964) found that medical students' grade-point averages were almost completely independent of all factors having to do with performance as a physician.
- In the mental health field, considerable evidence exists that academic credentials are inappropriate as a means of identifying competent practitioners. "In clinical psychology the research orientation for most programs combined with a distinctly anti-practitioner attitude make it a less-than-ideal ground for training practitioners." (Hogan, 1977, p. 9) Furthermore, Bergin and Solomon (1970) found slightly negative relationships between verbal empathic ability and each of the following: verbal intelligence scores, the Graduate Record Examination in Psychology, and grade-point average.

Hogan's (1979) extensive review of the literature in mental health brought him to the pessimistic conclusion that doctoral students actually decrease in therapeutic effectiveness over the course of their degree program. Even more convincing evidence of the lack of relationship between professional education and competence, Hogan believes, are numerous studies comparing the effectiveness of paraprofessionals and lay people with that of credentialed practitioners. "In virtually all studies the highly trained professionals perform no better than their noncredentialed counterparts. In fact, in approximately half the cases, the nonprofessionals actually perform with superior results." (Hogan, 1977, p.11)

Social Equity and the Educational System

Various structural aspects of education have led to inequities in educational opportunity: Two discussed here are admissions and accreditation. Partly as a response to systemic inequities, several kinds of nontraditional educational pathways have developed. Some of the problems they face are briefly reviewed.

Admissions and Inequity

Entry into postbaccalaureate education is restricted to those who can demonstrate narrow academic talent, abilities that are mostly held by middle class students. However, the manpower needs of society require a broader range of skills and talents than is represented in this narrow range of people. Ironically, not only is there no relationship between selective admissions procedures and professional competence, but current procedures (usually multiple-choice tests) do not even assess academic competence meaningfully. All the evidence points to educational opportunities being allocated on the basis of memory for facts or test-taking ability. Admissions tests that tap a wider range of talents might be more equitable and better serve both educators and employers. At the same time, such tests could measure important cognitive and "noncognitive" characteristics presumably valued in academia such as problem-solving, critical thinking, moral

reasoning, tolerance for ambiguity, and interpersonal abilities.

Admissions procedures will not change radically so long as educators view their roles as "picking winners" rather than "adding value."¹ To the extent that this philosophy persists, equity achieved by opening education to new categories of students through the use of quotas, lotteries, work experiences, and other mechanisms used experimentally in recent years will not be institutionalized. The "picking winners" approach has led students, too, to question the relevance of education, because they do not want to waste time, money, and energy playing the credentialism game (e.g., White & Francis, 1976).

Accreditation and Inequity

Professions predominantly require educational credentials from formal programs that are accredited. Requiring accreditation would not be improper if it were based on whether a program produces competent practitioners, but accrediting bodies instead focus on whether education is provided according to process standards. Typical concerns are for student/faculty ratios, the number of classrooms and facilities, library resources, and faculty background and training:

No effort has been made to determine whether any of these factors are related to future professional performance. These arbitrary criteria of excellence have excellent potential for political abuse. The accrediting arm of the American Bar Association, for instance, is generally acknowledged as having driven most night law schools out

of business due to its insistence on full-time law school faculty (Newman, 1973). The degree to which professional associations control this process is illustrated by the fact that 39 states require graduation from a law school accredited by the American Bar Association in order to sit for the bar examination. Not coincidentally, as the Newman Report points out, the ABA also writes the examination, and evaluates the 'moral fitness' of all candidates for the Bar. Members of the state licensing boards frequently serve on accreditation organizations and are often officers of the professional associations representing the field. (Hogan, 1977, p.14)

Nontraditional Education Systems

Traditionally, education has perceived its role as producing broadly educated people who are better prepared to continue their learning. The prestige of formal education has depended on acceptance by employers, students, and the public that its products are indeed superior to those developed in non-traditional education and training settings. Certainly competence partially depends on education, but formal education is only one means of gaining requisite knowledge. Non-traditional pathways of attaining competence are needed that will substitute for traditional educational credentials. Innovations in educational delivery and credentialing have increased in recent years through programs such as "universities without walls," credit for experience, external degree programs, and the like. Also, there are some competency-based education programs that have attempted to define the outcomes of learning in terms of more work-related criteria.

Some professions have resisted educators' attempts to

prepare people directly for work, because requiring broader educational credentials than may be needed provides them with bargaining power in the marketplace and maintains the power and prestige of the professions. But, educational credential requirements, especially those prerequisite to certification and licensing, easily become discriminatory devices because minorities and women as groups have fewer credentials.

Educators by and large are undecided about how to play the dual role of preparing people for work and fostering self-development. This dilemma is exacerbated by demands for equity and other social pressures:

On the one hand educational systems are required to continue serving as selection and certification agencies, making sure that individuals are suited to, and competent for their social and occupational roles; on the other hand they are increasingly expected to provide for personal development, give everybody a fair chance, and contribute to greater social equality. In addition, with the lack of consensus as to the priority to be assigned to these functions and the changing and diverse interpretations of such lay concepts as merit, competence or equality, it is hardly surprising that educational systems are not seen as adequately fulfilling many expectations of different social groups. (Organization of Economic Cooperation and Development, 1977, p.13)

The Current Status of The Education-Certification-Work System

In conducting the research for this chapter, we found the components of the education-certification-work system functioning independently, and sometimes even at cross-purposes. There were examples of various components working together

when their constituents happened to agree that a linkage between them was desirable, but such cooperation tended to result from accidental congruence between self-interest and presumptions about the factors constituting competence, rather than responses to evidence that certain factors are more important than others, or to purposeful attempts to relate assessment to job performance outcomes.

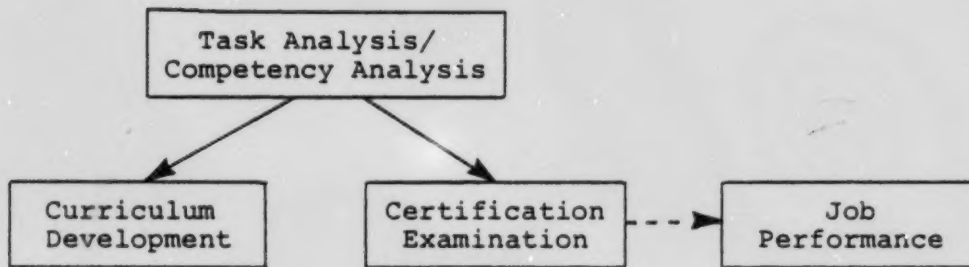
Our review of the state-of-practice found several variations in the relationships between educators, certifiers, and professions that demonstrate the closed circle of extant credentialing systems. These relationships are diagrammed in Figure 2. Following is a description of several of these variations, each of which involves job analyses, certification testing, and curriculum.

Figure 2a illustrates certification and curriculum development as originating with a job task analysis and/or a competency analysis. Currently, mental health human service workers are developing a certification model based on a job competence analysis which educators will use in a new program approval process. The job analysis goes beyond a mere listing of tasks to specification of interpersonal skills and other behavioral and cognitive skills required for competence on the job. This effort is directed by the Southern Regional Education Board in Atlanta, Georgia, and is several years away from completion. Intentions are to validate the certification model against outcome criteria and eventually to evaluate college curricula on the basis of these measures (McPheeters, 1978).

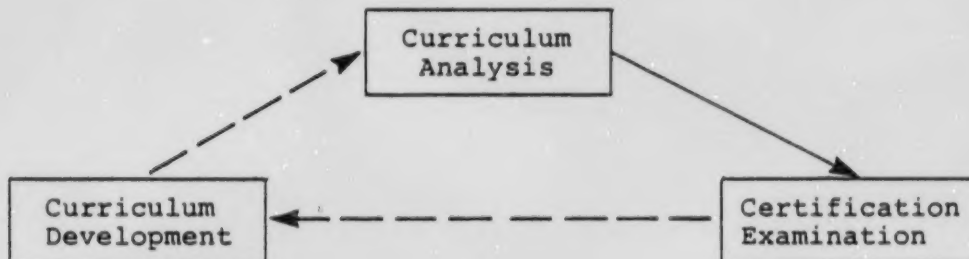
FIGURE 2

Relationships among Education,
Certification, and Work

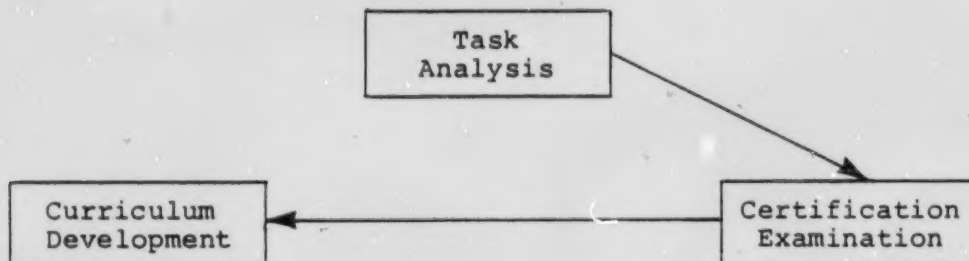
2a. TASK/COMPETENCY ANALYSIS DRIVES CERTIFICATION AND CURRICULUM



2b. CURRICULUM DRIVES CERTIFICATION



2c. CERTIFICATION DRIVES CURRICULUM



Pharmacists at the University of Minnesota (Cyrs, 1977) developed a list of job tasks that practitioners agreed was comprehensive. (Development of curriculum based on this analysis was begun, but the project ended because of a lack of funding.) The pharmacists' national certifying agency, whose examination is used for licensing in some states, is using a separate job analysis to revise its test. Both job analyses were confined to tasks, and neither the job analyses nor the examination has been validated with outcome criterion measures. Nevertheless, the potential for integration of job analysis, curriculum, and certification is clearly present. The Child Development Associates developed a similar model with, in fact, better integration among tasks, curriculum, and certification, but none of the three components is very rigorous. Here the analysis guided both curriculum and the assessment process. The certification measures are in the process of being evaluated against outcome criteria. Figure 2b represents still another type of certification and education interaction in which curriculum drives certification in the absence of a task analysis. This tautological model is exemplified by speech pathology and audiology. This profession's certification examination is based on the National Teachers Examination, which is designed by academicians. The test is content valid only according to what is taught in speech pathology and audiology educational programs. Neither the curriculum nor the certification system is related to any rigorous job analyses.

Similarly, the certification systems of funeral home directors, cosmetologists, and numerous other professions reviewed in our survey are based on educational curricula rather than job analyses.

In direct contrast, job analyses can lead to blueprints for multiple-choice certification exams independent of curriculum. Eventually, these exams may drive curriculum, as illustrated in Figure 2c. In these models, educators, as well as candidates, must rely on test design committees' concepts of professional competence, and they may feel their academic freedom is compromised by having to meet standards or criteria for competence developed independently of their own concepts. Most certification tests are neither open to scrutiny by educators nor amenable to change by them, and in any case are often accepted as a "fact of life" around which courses and curricula are to be organized. In such systems, it might appear appropriate for educators to evaluate their programs according to how well their students perform on certification exams. But this practice has several drawbacks. First, it could stifle variations in curriculum, especially regrettable if changes in practice go unrecognized by the certifying body. Also, using certifying examinations as indicators of program effectiveness creates pressures to teach narrowly, in order to maximize test scores. In some of the professional schools of one occupation reviewed, students are discouraged from taking an exam if they are not expected to pass because the schools'

records of percentage of students passing are used to recruit new students.

Educators frequently teach in isolation, using neither direct nor indirect knowledge of job requirements. Moreover, they have difficulty obtaining reliable information about credentialing or accurate forecasts of future manpower needs in a specific field. Thus, they may be frustrated in trying to prepare students for either certification or jobs. Emotional commitment to what one is teaching and the survival interests of faculty and schools also can overshadow concerns about whether there is a market or whether teaching is appropriate for manpower needs. Dissatisfaction with the mismatch between job training and opportunities has been one impetus for efforts to bring "truth in packaging" to education. Because employers have not yet discovered adequate ways to select people who are competent, they often default to convenient educational credentials. By so doing, employers must accept the academic notion that more is better. In most professions where advanced degrees are available, the highest graduate degree frequently becomes the minimum standard. Criteria for hiring and promotion may require advanced academic credentials irrespective of their lack of demonstrated relevance to competence. However, most of the truly necessary academic competencies and all work competencies conceivably could be acquired outside of formal educational settings. Some educators would resist experience as a basis for credentialing. In fact, some

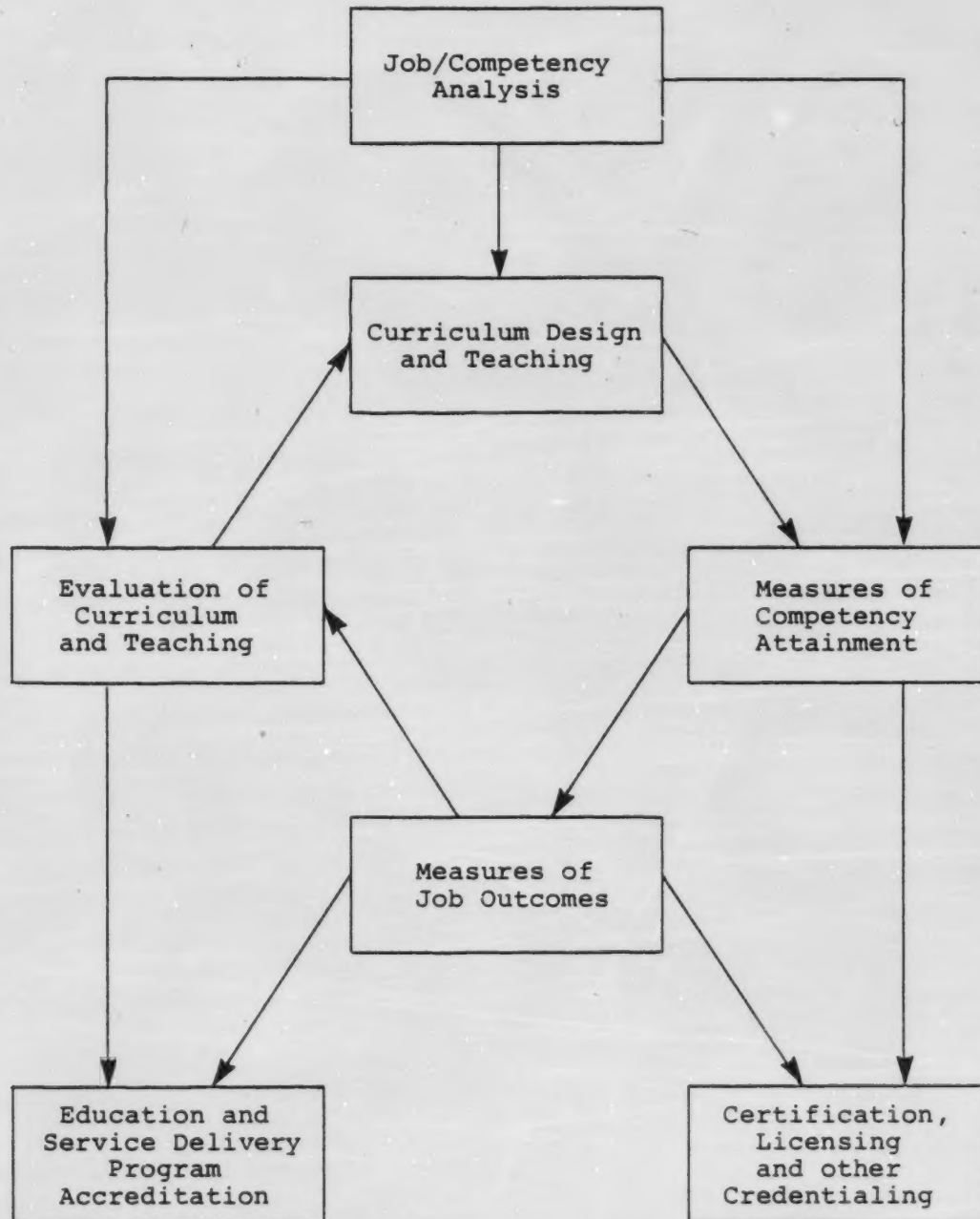
already resist proficiency exams in the professions partly because they allow workers to bypass formal education.

A Model System for Linking Education, Certification, and Work

A brief examination of an ideal model for linking manpower components in contrast with the existing patterns of coordination (as previously described) might help clarify where improvements could be made. In the ideal model, educational institutions, certifying and licensing agencies, accreditation bodies, and various independent standard-setters would share common definitions and standards. A logical schematic of actors and activities tying manpower components together is presented in Figure 3. The key to this hypothetical system is understanding what constitutes competence. Thus, the system is initially driven by analyses of competence that include the identification and operational definition of competence, including first the job roles, functions, tasks, and activities involved, and then the knowledge, skills, attitudes, and other characteristics of individuals that are required to carry out these activities. Definitions of required competencies would then guide the processes involved in primary, secondary, and tertiary credentialing. That is, curriculum and teaching would be oriented toward producing students who present the skills, knowledge, and characteristics required for effective job performance. Liberal learning, of value in itself, need

FIGURE 3

Competency-Based System of Credentialing



not be compromised, but its relationship to outcomes would be determined.

For educators to know if their programs are effective in meeting a common production function, an assessment of their graduates would reflect the full range of knowledge and abilities required for competent work performance. Some of these measures might be indirect or limited to intermediate skills that are not apparent in every job. In this ideal model, measures of competence would have to be more valid than is the case in the current state of the practice.

The same kinds of measures used to evaluate educational effectiveness would be equally appropriate for secondary credentials, including those based on proficiency exams, because they would be valid indicators of competence. Theoretically, only work experience requirements and perhaps peer review would be needed in addition to the primary credential. However, uniformity of standards should not necessarily translate into uniformity of curriculum and teaching. The freedom of academic institutions to innovate and produce unique products should not be stifled, so long as demonstrated relationship with job outcomes is maintained. Similarly, accreditation and tertiary credentials should be based on outcomes, keeping a balance between self-interest criteria on the one hand and quality and consumer interest criteria on the other.

A job analysis that is validated with respect to job outcomes should not be static, because job requirements change

according to changing client needs, new knowledge and technology, interprofessional coordination, changing legislation, and so forth. All future modifications of job definitions, education and certification requirements should be anchored to positive outcomes. This is necessary for the maintenance of a competency-based integration of these three factors in the manpower resource system.

Implementing a System of Competence-Based Credentials

Breaking Formal Education's Monopoly Over Training and Credentialing

At least two approaches to breaking the monopoly of formal education over training and credentialing can be considered. First, competence attained in nontraditional ways must be recognized as more than second-rate. This can happen only when general education is better integrated with all types of vocational education. Nontraditional students have taken part in competency-based education, but they have often been relegated to the ranks of "paraprofessionals," even though in many health professions, especially mental health, they are as skilled as the professionals (Hogan, 1979).

Second, people should be granted credentials for competence, no matter how that competence is attained, and these credentials must be made compelling to employers and other users of the professionals. One creative strategy for doing this, which recognizes the legitimacy of education's premium

on scholarship, the manpower needs of the country, and students' needs to fulfill them, was described by the Newman Task Force (1973).² It recognized the principle that postsecondary institutions should cease to monopolize the award of professional qualifications, and proposed the establishment of Regional Examining Institutions to provide a variety of evaluation and credentialing services. They would assess all people seeking entry into a profession regardless of whether or not they had attended accredited postsecondary educational institutions. The attraction of this idea is that non-educational criteria would be developed for occupational placement.

Better performance criteria, definitions of job functions, and instruments that validly predict those who can perform these functions would be needed to fairly and accurately certify competence attained in nontraditional ways. More than knowledge skills would have to be assessed (perhaps using assessment center technology), and the credentials would have to be validated against job performances to make them competitive with those credentials currently assumed to be proxies for competence. The beginnings of such a system already exist in academia in the New York Board of Regents External Degree Program and in the Consortium on Assessment for Experiential Learning program.

Prerequisites to a Competency-Based System of Manpower Assessment

The goal of a competency-based assessment system is to grant credentials on the basis of a single production standard for each category of professional manpower, which can then be modified and updated in the face of advances within the professions. The elements necessary for implementing such a system include job analysis, communication, collaboration, planning, and management.

Job Analysis

Job analyses are basic to competence assessment, and substantial research is needed that will enable the development of better job analysis techniques appropriate for a single profession practiced in a variety of circumstances. Analysis of basic job competencies is also fundamental to the entire human resource development system. In recognition of consumers' needs for professional services, job analyses should also specify the kinds of skills that should be planned for and the number of people needed to deliver services.

Communication

The technologies of competency-based credentialing must be disseminated and adopted by organizations in different parts of the human resource development system. Hence, communication links are required between education, certification, and practice. Mechanisms must be established to facilitate the

transfer of technologies and to persuade independent licensing boards, professional associations, and educational institutions to incorporate competencybased methods into their programs. Liaison committees, personnel movement between organizations, mass communication, and data transfer, as well as informal personal contact could all serve this purpose.

Collaboration

Because current credentialing practices are lodged deeply in the interests of established professions, any changes will require collaboration among competing professional groups. Active attempts at coalition formation, conflict resolution, and decision making are critical in achieving change. Mechanisms to coordinate and integrate decision making might include:

- Advisory committees, task forces, or study groups to seek information and recommend courses of action on behalf of the groups represented;
- Overlapping planning staff for the professional education, professional service, and professional credentialing components of the system;
- Consultation between organizations or professional groups on policies concerning credentials;
- Creation of coordinating organizations or professional groups as to the competency domains of the profession;
- Creation of coordinating organizations to manage shared resources or establish joint policies (e.g., joint practice commissions); and
- Joint programs (e.g., joint efforts to establish core training programs or core competencies for skills that overlap professional groups).

Planning and Management

Although a single standard for education, certification, and human resource utilization would tend to unify previously uncoordinated elements of manpower development, in order to establish and maintain that unification, ongoing management of the system is required. Management at the state level appears to be most appropriate for developing a more comprehensive system of human resource development and planning. States already have principal responsibility for both higher education (state university systems) and credentialing (licensing). There are some notable examples of states (e.g., New Jersey, Minnesota, Virginia, Wisconsin) that have health manpower policies that are coordinated among the three system components. A recent evaluation of the Health Resources Administration's Health Manpower Linkage Program describes in detail the efforts of 21 states to develop manpower systems (Cohen, Cohen, Chin, et al., 1979). Findings from that review indicate that the credentialing component is most often the weakest part of the system in terms of its management and of the technology needed to carry out its function. Furthermore, the licensing requirements of many states were found to inhibit solutions to health manpower problems. For example, state restrictions on nursing practice limited delivery of primary medical care services in rural areas lacking physicians.

Planners have a unique role in implementing a system of competence-based credentials. The fundamental activities of

planners are to:

- Coordinate the production components of the system with the professions, by establishing the communication and collaboration necessary to disseminate information and bring methods into alignment;
- Analyze service needs, job content, and educational needs and forecast the number and types of manpower needed, based on information from multiple sources;
- Mediate, because of planners' ability to draw information from all parties, and maintain neutrality, which would assure greater acceptance of recommendations; and
- Facilitate decision-making.

These activities are crucial to the decision-making executives of autonomous organizations which control the educational, certification, and human resource utilization processes.

NOTES TO SECTION III

¹"The 'value added' approach to (achieving) the goals of higher education suggests that admission procedures should be designed to select students who are likely to be influenced by the educational process, regardless of their level of performance at entrance. Instead, admissions officers in selective institutions function more like race track handicappers: they merely try to pick winners. Handicappers, it should be stressed, are interested only in predicting the horses' performance, not in helping them to run better and faster." (Astin, 1975, in Organization of Economic Cooperation and Development, 1977, p. 49)

The Newman Task Force, "like other critics of the current educational monopolistic system, might argue in favor of . . . 'stressing the distinction between credentialing practices in general education and in job-related training, and having a clearer separation between degrees which are general indicators of intellectual interests but not related to occupational competence and credentials which are strictly and legally job-related.' Such proposals are intended, on the one hand, to safeguard liberal education and prevent it from being distorted by the excessive use of the Bachelor of Arts degree as entry tickets to all professional and graduate programs. On

the other hand, it is claimed that this separation would provide for greater accessibility to job-related credentials for individuals who acquire the necessary competencies and skills outside of the formal system." (Organization of Economic Cooperation and Development, 1977, p. 67)

IV. CONCLUSIONS

Goals of Credentialing Reviewed

Credentialing may be defined as formally recognizing competence. A credential may take the form of a certificate granted by a nongovernmental or professional organization in recognition that an individual has met qualifications specified by that group; or it may take the form of a license, granted by a government agency, permitting a person to engage in an occupation given that he or she has attained the minimal degree of competency necessary to insure that the public health, safety and welfare will be reasonably protected. Regardless of the process by which a credential is attained or the espoused rationale for that process, credentials are used to regulate the quality, number and kind of individuals allowed to practice a profession.

Reliance on a credential to regulate access to a profession may benefit employers, certification agencies, or established professionals. In their efforts to assure productivity and profits, employers can hold out special recognition as a reward to workers who qualify for prestigious or job related credentials. They may attempt to upgrade their work force by selecting on the basis of credentials presumed to reflect job skills. Certifying agencies attempt to maintain professional standards by controlling entry into an occupation. Their

intentions may include protection of the public from being victimized by inept practitioners, the education of consumers to identify competent professionals on the basis of their credentials, and/or keeping the unqualified from attempting to practice a profession. Professionals themselves benefit from the existence of credential requirements. Upon earning a credential, they are invested with an identity as a member of the professional group, with the accompanying status and access to a choice of jobs requiring the credential. While these many goals and functions of credentials seem logical and laudible, we have, nonetheless, identified uses and abuses of credentials which may be self-serving to the exclusion of the legitimate concerns of other constituencies which use the credential in making decisions about professional services. In the preceding sections we also identified examples of and opportunities for the design and use of credentials to the mutual benefit of employers, consumers, certifying agencies and professionals.

Major Conclusions from the Study

In our study we discovered that more than 2,000 occupations are currently regulated in some way. Yet, despite the current proliferation of credentials and occupations which require them in order to practice, the credentialing systems they rely on usually lack a research base for choosing indicators of competence, for designing measures, or for demonstrating a relationship between the requirements for obtaining a

professional credential and the competent discharge of one's professional duties.

The typical certification and licensing exams used as the basis for awarding a credential bear witness to the indicated research needs. When an exam is given, its content usually taps only basic job-related knowledge. Skills, attitudes, and motivation needed to do a competent job are not tapped by the usual paper and pencil, multiple-choice exams of 100-150 questions. Consequently, certification exam content doesn't approach tapping the many characteristics which combine with job knowledge to produce competent performance. Although test performance may be related to a candidate's performance in a professional education program, there is no convincing evidence that academic achievement is related to job performance. This gap in coverage of important job-related skills underscores both the potential for alternate testing procedures (such as simulations, which are rare) and the current scarcity of alternatives in use.

If a certifying body wants its certificate or license to be a true indicator of professional competence, then time and resources must be devoted to a threefold development process including:

1. Carefully defining of competence;
 2. Developing of measures that are appropriate to the requisite characteristics and purpose of measurement;
- and

3. Validating the chosen competence measures vis a vis later job performance.

These prescriptions for developing a valid competence measure are standard for testing in any context. Keeping these in mind, it is no wonder that certification and licensing exams have come under increasing fire for not being good measures or predictors of competent job performance. Our study showed that careful job analysis to define job competence was exceedingly rare. Studies of job performance criteria, especially as part of a validation study for certification exams were virtually nonexistent. The vast majority of exams follow a standard format tapping knowledge with 100-150 multiple choice questions. Validation is undertaken neither to validate test items, nor cutoff scores, nor the relationship between continuing education requirements and job competence.

While the bulk of this chapter has been devoted to a discussion of exams used for credentialing, the vast majority of professional credentials are awarded on some basis other than a test. Eligibility requirements such as age, degrees, etc., not only appear suspect at their face value, but have never been validated where used. Limiting job access on the basis of arbitrary personal characteristics or lack of formal educational requirements is common. This type of requirement for a credential is deficient in the same ways as most certification and licensing exams (i.e., lack of job analysis, criterion studies and validation). They also frequently function to exclude minorities and other nontraditional applicants

on the basis of non job-related credentialing requirements. While biased use of this type of eligibility requirement is not visible, it is not unique to non-test credential requirements. Use of any test or requirement which is not related to job competence has potential for inequitable award of certificates or licenses to practice a profession.

As indicated, however, credentialing should not occur in a vacuum. Human resources are developed in three sectors of the environment. Education, certification, and work all contribute to the appearance or acquisition of job-related competence. Unfortunately, each sector tends to be self-serving at present. Educators balk at plans to award credentials to individuals who demonstrate competence but have not attended formal educational programs; they don't balk when their programs are accredited on the basis of faculty-student ratios. Certifying agencies set cutoff scores on required exams or choose eligibility requirements on some idiosyncratic basis of unknown relevance to competent performance. Never are all applicants accepted. Organizations raise and lower eligibility requirements (in terms of credentials) depending on job market conditions with no demonstrated relation to competence. Education, certification, and work are therefore operating at cross-purposes, perpetuating the use of credentials of no demonstrated relationship to performance, based on education with no known influence on competence, and for professional positions for which competence is seldom defined. All sectors

could be served if work force decisions were made on the basis of credentials of demonstrated validity for tapping or predicting job competence.

Recommended Changes and Their Implications

Obviously there is a great need for research and development in the area of identifying individual characteristics that are required for competent performance and linking them to job requirements. Such research should also attempt to determine both new measurement techniques and better uses of existing methodologies. Four research needs related specifically to testing techniques are:

1. development of better ways to measure personal characteristics that are not suitable for assessment by limited written response instruments. Designs presently in use which more closely resemble the type of thinking and action required on the job include: latent image tests to measure patient management skills; in-basket exercises to measure information management; behavior rating scales to measure interpersonal relationship development and management; and simulation exercises to measure the integration of knowledge and behavioral responses.

2. research on ways to test for generic skills that would have utility across a broad range of occupations and levels; for example, the stages of cognitive development enumerated by Jean Piaget (Flavell, 1963) or the stages of moral reasoning (Kohlberg, 1973).

3. research on ways to incorporate existing tests of complex cognitive processing skills such as divergent thinking, cognitive flexibility, and problem solving, into credentialing procedures.

4. research on the more flexible use of existing assessment and credentialing tools, including academic credits for experience, proficiency testing, and equivalency standards.

A research agenda of this scope would be very costly and would necessarily require substantial financial support from government, private foundations, and the professions. The likely benefits would include new and multiple measures of competence that could be validated more readily, greater equity as rigid formal education requirements are replaced by more flexible standards, and ultimately, higher quality services to employers and consumers.

The incentive for establishing this research program might be derived from a thorough analysis of the costs and benefits of present measurement techniques. For example, it might be found that errors in medical laboratory testing (which result in an annual \$25 billion health care problem) could be prevented through more reliable assessments of medical technologist candidates. Thus, developing more sophisticated measurement devices might be less costly to consumers in the long run than continued reliance on present methods.

Changing current credentialing practices has implications for the education that precedes the certification of a

professional and the work that follows. Recommendations for significant changes in both spheres are indicated below. However, because their current practices are deeply rooted in the reward structures, communication patterns, and professional traditions of the present human resource development system, implementation of competency-based assessment for certification will not be easily achieved. Certain changes in the education and work sectors are therefore recommended to bring them closer to the ideal of preparing and employing competent workers. Given that competence based certification is a means to the goals of all three interdependent sectors, changes in education and work are inevitable; if undertaken simultaneously they may complement the competency-based certification process while better serving their own goals.

Recommendations for Change in the Educational Component

- Development of a closer connection between education and practice. Given that certification bodies relied on credentials based on job-related competencies, educational institutions would eventually find it necessary to conform to job-relevant standards for curriculum design, in order for their students to be certified. To incorporate such standards into education educators would need to communicate closely with employers to understand what the job relevant skills are.

- Development of experiential learning models. In order to teach and certify job-relevant competencies, education

should expand beyond a narrow focus on cognitive and motor skills and include job related affective skills. For example individual and group simulations could be incorporated into curricula for professions that involve client interaction and used to assess and improve interpersonal skills.

- Establishment of core curriculum for clusters of similar occupations. Basic skills relevant to a variety of occupations could be taught to candidates for several professions at once. The existence of core curricula could also point out similarities of skills across jobs and facilitate mobility of students in their careers.

- Development of competence based assessment techniques. If the educational credential is to be meaningful indicator of competence, then performance measures taken in the course of the educational program should be good measures of the individual job-related competencies reflected in the curriculum. Appropriate assessment techniques could help ensure that the educational credential, in fact, reflects the competencies for which it is used to select.

- Development of new accreditation mechanisms. If graduation from an accredited program continues to be an eligibility requirement for a credential, and the trend toward more competence based credentialing continues, then an educational program should be accredited in terms of the breadth and depth of its program in teaching generic and specific competencies. There is no persuasive evidence that current

criteria for accreditation in any way reflect competence of the program to teach or competencies taught.

Recommendations for Change in the Work Component

- Sharpening of professional boundaries. By defining and assessing competencies, professions that use like skills would be able to define their areas of overlap in similar terms. An opportunity would then be open to reduce arbitrary boundaries that now are reinforced by licensing restrictions and reimbursement rules. Real differences in competence among professions could likewise be sharpened, enhanced, regulated, and reimbursed appropriately.

- Efficient organization and design of work. Sharper job descriptions defining professional competence would enable more accurate classification of jobs and allocation of professional personnel to jobs. Clear definitions of job competence would also facilitate the design and operation of interdisciplinary teams for service delivery. Career mobility and availability of manpower could increase by virtue of switching work design and manning to reflect competence of workers.

- Development of more equitable reimbursement. Reimbursement could be based on the service delivered rather than the status of the professional delivering the service. This practice might reduce costs. It might also result in more efficient use of highly skilled professionals by making them

noncompetitive for some lower skill tasks and therefore available for more difficult ones.

- Acceptance of non-educational credentials. Since much of the current adverse impact of hiring practices results from a lack of equal educational opportunity, opening non-educational routes to demonstrating competence may reduce adverse impact. Personal characteristics would only become relevant to hiring if they bore a relationship to job competence.

This chapter has discussed numerous aspects of the credentialing system that would benefit from improved understanding of job competencies. In addition, one specific credentialing issue that should be addressed is the feasibility of setting national certification standards like those currently being developed in the health fields by the National Commission for Health Certifying Agencies.* A national competence based approach would have obvious advantages for workers, employers, regulators, and consumers by reducing fragmentation, increasing job mobility, enabling consistent standards, and possibly helping to ensure quality of services. It also would raise fundamental questions about the nature of the nation's education-credentialing-work system--past, present and future. While there is growing interest in national certification systems (Cohen, 1975), there is also a legitimate concern for

*A private consortium of health professions, established in 1977 to set and enforce standards of certification across a wide spectrum of health occupations.

preserving diversity and some local autonomy in a national system, especially in occupations that are not yet clearly defined (Hogan, 1979). Thus, the preceding recommendations for research and change suggest ways to rationalize the credentialing process without stifling innovation and experimentation.

APPENDIX A

APPENDIX A:
Historical Perspective on Licensing

Role of the Medieval Guilds In Regulating Occupations

Perhaps the earliest historical antecedent to occupational and professional regulation was the guild system that flourished during feudal times. There is considerable support for the view that modern occupational and professional associations are direct descendants of the guild form of regulation. In many respects, guild regulation resembles that of modern-day licensing activities of professional associations (Hogan, 1979).

The localized nature of economic life in medieval Europe led to the establishment of guilds by municipalities. These guilds were of three basic types: (1) merchant, (2) craft, and (3) professional. The merchant guild's origin lies, in part, in the revival of trade in the twelfth century. Comprising merchants within the town, clergy, and occasionally merchants from neighboring towns, the guild was designed to protect the economic interest of the merchant class. In time, the merchant guilds exercised monopoly control over the external trade of a town. The craft guilds were set up by free artisans who sought to promote the regulation of the handicraft industries. The professional guilds included those groups

that received formal training in universities, including teachers, lawyers, and physicians (Council of State Governments, 1952).

Medieval guilds shared several attributes. Most important was the requirement of compulsory membership, designed to keep out itinerant merchants. In addition, applicants needed approval of guild members and were required to pay high entrance fees, which further enhanced the exclusivity of these organizations. The guilds were also responsible for setting apprenticeship requirements, limiting the number of apprentices available to a member, and imposing minimum prices for goods and services and minimum wages (Hogan, 1979). Thus, the guilds were able to exercise total control over the manner and methods in which individuals conducted their commercial activities or practiced the professions. Guilds' restrictions progressively increased over time and resulted in obvious benefits and advantages accruing to their members.

By the end of the sixteenth century, the guild system was in decline and was no longer an effective instrument of economic organization. The rise of strong nation-states ruled by sovereigns who demanded allegiance to themselves rather than to private social groups greatly curtailed guild activities (Lieberman, 1970). Parliamentary laws affecting laborers and apprentices were passed that regulated wages, prices, and terms of apprenticeship when the guilds could no longer do so effectively (Gilb, 1966).

The emergence of mercantilism and the spreading Industrial Revolution further withered away the degree of control that guilds were able to maintain over members' livelihoods. The increase in the size of the economic marketplace and the accumulation of capital directly led to the expansion in the number and array of professions. The management of capital required the skill of an emerging class of accountants, lawyers, bankers, and others (Lieberman, 1970). The development of laissez-faire philosophy in the late eighteenth and early nineteenth centuries and the resulting emphasis on "contract" rather than status was an additional factor in the decline of the guilds (Council of State Governments, 1952; Hogan, 1979).

Occupational Regulation in the United States

The Colonial Period

The random development of occupational regulation in America, characterized as a "haphazard, uncoordinated and chaotic process" (Shimberg, Esser, & Kruger, 1973) was to some extent due to the colonists' reluctance to implement the guild system. By the time the colonies were for the most part settled and established, the guild system in England had already lost most of its economic potency. In addition, mercantile restrictions imposed on the colonies discouraged the manufacture of raw materials that competed with those manufactured

by English craftsmen. The predominantly agrarian make-up of the colonies further reduced the need for guilds, which operated most effectively in urban settings.

Although the colonies proved an unsuitable environment for the development of the guild system, the immigration of skilled craftsmen and professionals led to the development of a quasiguild system in America. The arrival of these skilled artisans, shipwrights, millers, blacksmiths, bakers, and shoemakers led to the incorporation of several guild features into colonial economic life. These features included: stratification of labor into master, journeyman, and apprentice classes; legal regulations for apprenticeships; and the authorization of the state to regulate prices. However, the scarcity of labor, the flexible interpretation of the legal status of the apprentices--with the most common apprentice being the master's son--and the infrequent instances of price setting all but consigned the colonial guild system to oblivion (Council of State Governments, 1952).

Until the end of the nineteenth century, licensing laws were virtually nonexistent. Few occupations other than those of the lawyer and physician were subject to regulation. One curious exception was an 1830 Ohio statute that licensed insurance solicitors (Gellhorn, 1956). In the field of medicine, the need for trained doctors and the lack of any medical institution for professional instruction and education assured dependence upon Europe for an adequate supply of physicians.

To meet the medical needs of the colonists, training was provided by means of an apprenticeship system. The more promising students were sent abroad and received their medical education in European centers of learning. Upon returning to the colonies, these foreign-trained doctors were able to provide up-to-date instruction to their apprenices (Means & Lynn, 1965). The overwhelming need for medical practitioners, even if they possessed only minimal skills and obtained rudimentary training, eclipsed the need for regulation.

The earliest attempt to regulate the practice of medicine was a law enacted in the colony of Virginia in 1639, which prohibited excess charges by practitioners (Caldwell, 1923). Ten years later, Massachusetts passed a law designed to limit the number of incompetent and plainly unqualified practitioners. In 1665, New York followed with a similar enactment, but neither the law nor its earlier counterpart was enforced. No further regulation of incompetent practitioners would appear for nearly one hundred years.

Regulation of Medicine: 1750-1850

After the passage of a considerable period of time that saw no new occupational regulation, in 1760, the City of New York passed an act that prohibited any person from practicing medicine who had not previously passed an approved examination. A similar piece of legislation was enacted in New Jersey in 1772. Both these statutes bear considerable resemblance to

current licensing legislation, with the most notable differences being their failure to contain any provisions concerning revocation of licenses (Caldwell, 1923).

In 1773, Virginia began to require that all surgeons, physicians, and dentists procure a license authorizing practice in the colony. Practitioners were assessed anywhere between \$30-\$100 for failure to obtain a license and were deprived of any right to collect fees for service performed. It is interesting to note the inclusion of dentists in the statute because not until the latter half of the nineteenth century was this class of practitioners required to obtain specialized education (Caldwell, 1923).

The Revolutionary War gave great impetus to physicians' efforts to seek legislation regulating medical practice. Although at the time of the war there were an estimated 3,500 medical practitioners, only 400 had been granted medical degrees. The need for competent medical attention in the army and the experience and reputation that many practitioners acquired in the field was a powerful tool in forming their professional ethic and outlook.

An immediate consequence of this heightened sense of professionalism was the organization and incorporation of medical societies. These societies were of major importance in seeking state regulation that would endow them with full power and authority to examine and license applicants to the field. A precursor of these medical associations was the New Jersey

Medical Society, established in 1766. Six years after its inception, and as a direct result of its activities, New Jersey passed a comprehensive medical practice act. In 1781, the Massachusetts Medical Society was incorporated and given full power and authority to examine and confer certificates on all medicine and surgery candidates. In 1791, the New Hampshire Medical Society was incorporated and granted similar powers. In the following year, a medical society was established in Connecticut with equally broad powers. In 1798, Maryland created a Medical Board of Examiners to examine prospective physicians and surgeons. By 1800, 13 of the 16 states had adopted legislation that granted licensing and examination powers to these private societies (Hogan, 1979; Caldwell, 1923).

During this same period, the number of proprietary medical schools increased dramatically. As more of these schools were founded, a debate arose centering around whether graduation from an approved school was sufficient to allow one to practice. The eye of the storm was located in Massachusetts, where in 1803, the Harvard Medical School maintained that its students were as well-qualified to practice as those licensed by the state medical society. Results of an examination administered to Harvard students and their state counterparts indicated that the former significantly outperformed the latter. Soon afterward, the law was amended to allow those

awarded a Harvard diploma, also, to practice. Similar enactments in other states allowed graduates from chartered schools to qualify for a license (Hogan, 1979).

The trend toward granting examination and licensing power to medical societies underwent a dramatic reversal by the middle of the nineteenth century. By this time, every statute enacted for the purpose of regulating professional practice had either been repealed or nullified by amendment and anyone desiring to practice was able to enter the field unimpeded (Caldwell, 1923). By 1850, the last two jurisdictions with adequate regulatory laws, New Jersey and the District of Columbia, had abandoned them (Hogan, 1979).

Several reasons have been set forth for this remarkable shift in attitudes concerning regulation. An increased sense of individualism inspired by Jacksonian democracy, and government application of a laissez-faire philosophy toward industry and trade pervaded the social fabric of the time and may have contributed to the distrust of centralized systems of regulation. In addition, many people had become increasingly disenchanted with restrictive practices of medical societies. The spreading of new doctrines--those of Samuel Thomson (Thomsonianism), homeopathy, and others that rejected current methods of treatment--led to a nationwide campaign for reform of the practice of the "regulars" of the profession. Homeopathic medical schools and societies enjoyed a steady growth until the end of the nineteenth century and were fully

supported by a large segment of the public. While states either repealed existing medical regulatory laws or let them lapse, in many states homeopaths and other "irregulars" were able to secure charters to establish societies endowed with the power to examine and license (Caldwell, 1923).

Despite the lack of licensure laws during the period, several authorities have argued that the medical profession was better regulated than at any other previous time (see Hogan, 1979). Because in most cases all one had to do to practice medicine was to obtain a diploma from a chartered medical school, medical education assumed a greater importance than previously. When shopping for medical services, individuals began to look for practitioners who had some medical education.

Occupational Regulation: 1850 to the Present

The most salient feature of occupational regulation in the late nineteenth century was the growth of national and state professional associations. In the field of medicine, the inability of many state medical societies to obtain a voice in setting standards and regulations led to formation of the American Medical Association (AMA) in 1847. Other professional groups that soon followed suit and established national associations included pharmacists (1852), civil engineers (1852), architects (1857), dentists (1859), and veterinarians (1863). These organizations all worked to establish standards of training and competence within their respective professions.

Today's licensure laws overwhelmingly reflect the strong influence of these national and state associations.

The AMA's initial efforts at securing effective state regulation were unsuccessful. The organization underestimated the strength of competing types of practitioners and set voluntary standards that proved to be too high, given the scarcity of physicians and the lack of widespread high quality educational institutions. However, by 1895 nearly all states had passed legislation establishing state medical examining boards. While this form of regulation did not endow medical societies with direct control of licensing requirements and standards, the societies continued to exert significant power through their ability to nominate board members (Hogan, 1979).

After the close of the nineteenth century, the leaders of many national and state professional associations began to recognize the need for a large membership base in order to increase their organizations' effectiveness. Admission standards became less restrictive so that, eventually, any licensee was eligible to join the association (Gilb, 1966). These organizations were simultaneously working to raise the standards of professional practice and were making it more difficult for applicants to become licensed. Added impetus to raising medical standards was given by the 1910 publication of Medical Education in the United States and Canada, by Abraham Flexner, and supported by the Carnegie Foundation for the Advancement of Teaching. The "Flexner Report" pointed to the appalling

inconsistencies in entrance requirements of the nation's 155 medical schools. Only 22 required one or more years of college, 50 required high school diplomas or the "equivalent," the remainder accepted a junior high school education or less. As a direct result of the report, the AMA's Council on Medical Education caused a number of medical schools to close or consolidate. By 1915, 67 schools met with the Council's approval and the total number of schools had fallen from 155 to 104. By 1920, the AMA had approved 70 schools out of a total of 85. By 1930, all 76 U.S. schools were approved. Within the space of 30 years, the physician population ratio had declined 26 percent (Lieberman, 1970).

As the number of professional associations of all types expanded in the early twentieth century, they increasingly pushed the enactment of state licensing laws. Between 1911 and 1915, 110 students licensing 24 occupations were enacted (Council of State Governments, 1952. The powerful role of associations in creating standards for practice was quite varied and included: sponsoring licensing legislation; proposing model laws; and calling for amendments to existing legislation as a means to upgrade professional standards. For example, in 1929 the Massachusetts legislature authorized the Commonwealth's department of Health to investigate the need for establishing a regulatory scheme for barbers. After conducting hearings, surveying relevant statutes and regulations in other states, and interviewing local boards of health in

cities and towns, the department concluded that there was no need for further regulation because adequate supervision already existed. Nonetheless, within two years, the legislature passed a licensing law that had been prepared by the Master Barbers' State Association (Rayack, 1975).

The trend toward requiring licensure before one is able to practice in a particular field has continued unabated. As part of this process, there has been a movement by states, at the direct urging of state professional associations, to amend their original laws from title acts to stricter practice acts (Hogan, 1979). In addition, higher standards have been accompanied by a shift from certification and registration to compulsory licensing. As of 1950, 73 occupations were found to require licensure before one was able to practice them (Council of State Governments, 1952). By 1969, the number had reached 500, with nearly 5,000 different types of licenses being granted across the country (U.S. Department of Labor, 1969).

The more recent trends in professional certification and licensure, and their implications for protecting workers and the public, are examined in the main text of the chapter.

APPENDIX B

APPENDIX B:
List of Costs and Benefits of State Regulation

Possible public goals in credentialing of health personnel (intended public benefits) may be identified as follows:

- Assurance of medical quality on the basic level of protecting public against incompetent or unethical practitioner.
- Enforcement of public accountability of health personnel groups.
- Acquisition of some public influence over monetary costs of health care.
- Acquisition of some public influence over manpower supply.
- Acquisition of some public influence over manpower distribution.
- Standardization of health personnel by specifying entry qualifications and scopes of functions.
- Establishment of stature and security for health personnel.
- Maintenance of superordinate role of the physician.
- Setting of guidelines for legal responsibility and protection of health personnel.
- Definition of valid practitioners for payment purposes.

Possible concomittant public costs of credentialing may be identified as follows:

- Restriction of manpower supply and distribution.
- Increase in monetary costs of health care because of increased salaries.
- Restriction of functional flexibility in scopes of practice and delegating mechanisms.

- Possible limitation of public accountability if mechanism is ineffective (see following section on "Actual Effectiveness of Credentialing Mechanisms").
- Tendency to establish inappropriately high standards of quality in technology and education, which raises monetary costs and limits access to care.
- Fragmentation of the health care team.
- Over-emphasis on formal as opposed to functional standards of quality.
- Possible limitation of careers to more educated applicants for higher social classes.
- Restricts mobility between job categories.

Possible private goals in obtaining credentialing of health personnel (intended private benefits) may be identified as follows:

- Acquisition of legal monopoly over scope of practice and the relevant body of knowledge.
- Limitations on entry into practice.
- Concentration of regulatory mechanism for better professional control.
- Elevation of health personnel status.
- Increase in income of practitioners.
- Maintenance of superordinate role of the physician.
- Support of health personnel groups, secondary institutions (schools and research facilities).
- Definition of valid practitioners for payment purposes.
- Establishment of job stature and security.

The possible concomittant private costs of credentialing may be identified as follows:

- Restriction of career mobility.
- Restriction of functional flexibility in scopes of practice and delegating mechanisms.

- Over-emphasis on formal as opposed to functional standards of quality.
- Possible limitation of careers to more educated applicants for higher social classes.

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